

FLIGHT

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

No. 369. (No. 3, Vol. VIII.)

JANUARY 20, 1916.

Weekly, Price 1d.
Post Free, 1½d.

Flight.

Editorial Office: 44, ST. MARTIN'S LANE, LONDON, W.C.
Telegrams: Truditur, Westrand, London. Telephone: Gerrard 1828.

Annual Subscription Rates, Post Free.

United Kingdom ... 6s. 6d. Abroad ... 11s. 6d.

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TO OUR READERS.

The Supply of "FLIGHT." Important Notice.

As the demand for "FLIGHT" is so great each week, it is of the utmost importance that readers should place their orders *firmly* for copies of "FLIGHT" at the bookstalls, their newsagents, or direct from the publishers, at 44, St. Martin's Lane, W.C., if they wish to secure a copy every week and avoid disappointment. The semi-famine in printing paper calls for this precaution in order that only actual numbers required are printed, and all wastage by unsold copies may thereby be reduced to a minimum, if not eliminated.

THE PUBLISHERS.

EDITORIAL COMMENT.



WITHOUT any manner of doubt, the Mile End Parliamentary election in progress at the present moment will go down to history as the first appeal at the polls to the electors upon the "air ticket." It is a record easily in the history of the world that a newly-born art and industry—such as is aviation—should at this phenomenally early stage of its infancy justify the arising of a champion with the main if not the sole purpose of fighting its battles in the House of Commons. Where, in the past, science has evolved some great upheaval in previous commercial practice, no instance can be found of a candidate for parliamentary honours coming forward with a single "slogan" in favour of

promoting the interests of that particular innovation. But like most other fixed ideas which hold good in regard to the possibilities of the navigation of the air, the art of aviation, now it has come, has once again upset all previous formulæ by producing a man of strong conviction who is prepared to sacrifice the worldly prospects attaching to his work in the past, as a result of a reasoned conclusion, that the future—and immediate future at that—calls for the utmost effort to be exerted, to bring the power of aircraft to a still further pitch of practicability, and enforce its teachings upon those who would seek to lead and teach us. Such is Mr. N. Pemberton-Billing, whose intention in this connection was announced by us last week. After "FLIGHT" had gone to press, the air parliamentary candidate issued his address to the Mile End electors, the following, which we reproduce as a matter of record, being Mr. Pemberton-Billing's pleadings in full:—

GENTLEMEN,

I ask you to send me to the House of Commons to obtain for this country a Strong Fighting Policy in the Air, and I ask you to vote for me, so that I can give the Government the benefit of my expert knowledge in regard to the gravest danger that besets you in the present war, viz., an early renewal on a much larger scale than we have ever experienced of bomb raids on London.

A strong Air Policy means that we shall have no more Air Raids on London.

The lights of London shall be raised.

London will return to normal life and conditions.

Further interference with your liberties will be unjustified.

Restrictions which annoy you will be removed.

Gentlemen, I stand for three things:—

First.—The Winning of the War.

Second.—The Defence of London.

Third.—The Freedom of the People.

And by the Freedom of the People I mean Justice in the broadest sense.

Redress for all those trades that have suffered by panic legislation, such as the Liquor trade.

Compensation where redress is against the best interests of this Nation at this moment.

This is my programme. My opponent cannot take over this programme. He has not been on active service. He is not a practical airman. He is not a fighting man.

My opponent can talk to you about these things, but he cannot do them.

Attend the meetings. Judge for yourself. Return me for Mile End.

Yours faithfully,

PEMBERTON-BILLING.

4, Elm Court,
Middle Temple, E.C.,
Jan. 12th, 1916.

The preliminary skirmishing between the rival candidates is now in full swing, and the contest will be decided on Tuesday of next week, when we shall hope to acclaim "P.B." as the first elected air M.P. of the country. If he fail to reach the top figure, why, if we know anything of him, he will go on trying elsewhere until he *does* succeed. In the meantime, it is no slight thing for Pemberton-Billing to have accomplished, the forcing of Mr. Warwick Brookes, the official candidate, into so strong a declaration of his views in regard to supremacy in the air. One of the planks in Mr. Brooke's address is as follows:—

"Having regard to the great importance of Air Service (both naval and military), I shall strongly support any measure which has for its object better organisation and further development, so as to place the entire service in the same predominant position that our Navy occupies to-day. In my opinion, no effort or expense should be spared to make London impregnable from aircraft attack."

So far good, and we welcome so definite a policy as is herein expressed. But this willingness to "support" such measures as may be brought forward is a very long way away from the spirit which is breathed by Mr. Pemberton-Billing. *He* is going all out for *initiating* activity and development of everything likely to help towards British Supremacy in the Air. He has a defined programme which, like a good many others, he is confident should lead to not only better security against air-raids in this country, but

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Aerial Postal Services in U.S.

THE United States Postmaster-General, Mr. Burleson, is evidently in striking contrast to most of Uncle Sam's legislators, as he is deadily in earnest about trying to get to work on an aerial mail service. Although his last proposal was vetoed, his estimates for 1917 include \$50,000 for aerial postal routes.

In recommending this departure, Mr. Burleson said:—"Postal needs will be served and the science of aviation encouraged by the establishment of an aerial mail service. From time to time experimental tests of the aeroplane as a carrier of the mails have been authorised, necessarily without cost to the department. During the fiscal year 1914 permission was given in four instances for the carriage of mails by this means, whereas application was made and permission granted in eight instances during the fiscal year 1915.

"There are sections of the country where this class of service

to effective action in bringing a little nearer the end of the war. And it is to this end he intends to exert all that is in him. Mr. Pemberton-Billing does not aspire to be the conventional political M.P.—"To Hell with politics" is his terse summary of the position of the unsavoury occupation of political life, as at present in force. And we agree with him most cordially. If this country is to be sacrificed in this war it will be the accursed "politics" which will be at the bottom of whatever humiliation we have to submit to. The vested interests in the various phases of political life have become so stupendous and intricate that if by means of this war a clean sweep of the putrid conditions, which have grown up in process of the unscrupulous intrigue which attaches to practically everything coming within the sphere of "politics," there may be at least that one result for which we may have to thank the action of the German beast—however innocent he may have been of any intention of benefiting this country or its people. In its own way "politics" in this country has become as abominable a shame and scandal as ever Prussian militarism in the land of its origin. Else should we long since have let the Navy give effect to the *real* blockade, which the easy-going public have for a year or more been led to believe existed. Bah, this sort of thing leaves a nasty taste in the mouth, and makes one think that Mr. Gibson Bowles is about right when he affirms that "the terror of neutrals is a mere Foreign Office boggy, but that department could not live without a boggy in order to cover its own failures. If left alone the Fleet could make a certainty of the war."

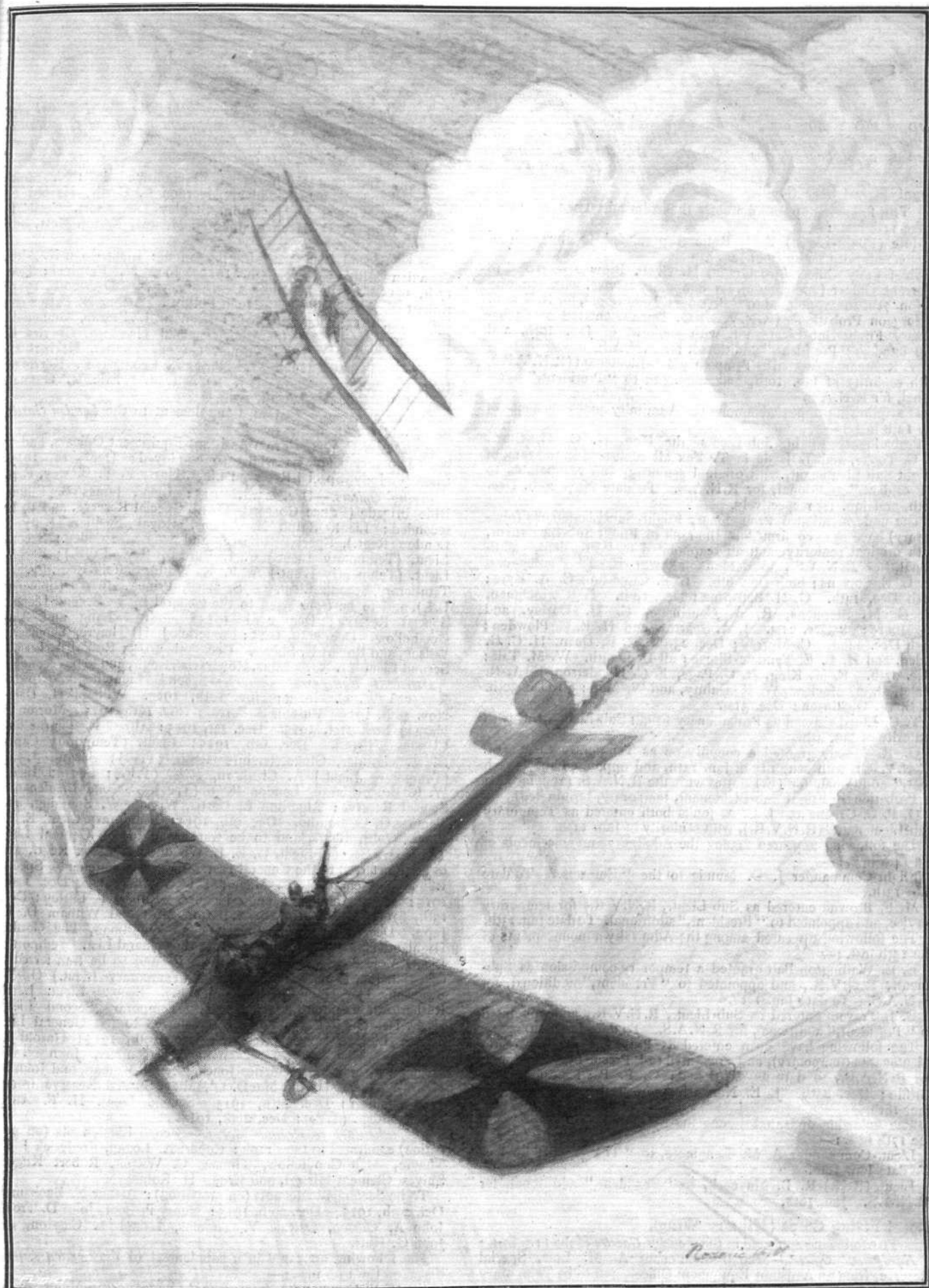
That Mr. Pemberton-Billing, if he gets the chance, will do his little bit in Parliament to assist the Flying Services in showing what they can accomplish in a big way, when opportunity is afforded them, we have every confidence. That he is a live man is demonstrated every minute of the day down Mile End way, as any one may judge if they but watch his methods in the district. He has unquestionably made many friends by his earnestness of purpose and manner, and we wish him every success in his big effort to rouse the "political" ring to its duties to the country so far as the Service of the Air is concerned. Whether other views which may be held by Mr. Pemberton-Billing are founded upon as equally sound a basis, time will show, but it is sufficient for us if he carries out his purpose of fighting for a Supreme Air Service, should he find himself at the top of the poll on Tuesday next.

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could be advantageously employed, and therefore the estimates for the fiscal year 1917 include an item of \$50,000 to defray the cost of an experimental aerial postal service. This will give a much needed impetus to the development in this country of this very important means of communication. The department has compiled a list of routes on which aerial mail service could be established to material advantage."

A Dirigible for the U.S. Navy.

It transpires that the "giant dirigible," which was to be built for the U.S. Navy, is to be 175 feet long and 50 feet diameter. Work on it has been begun at the Navy yard, under the direction of Naval experts. It will be equipped with powerful engines and dynamos, and the armament will include a battery of quick-firers. It is stated that it will carry a score or more of men, and is designed to make long voyages.



"BATTLE-ROYAL." From an original drawing by Roderic Hill.

The British Air Service

"PER ARDUA AD ASTRA"

UNDER this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the LONDON GAZETTE, it is not repeated in this column.

Royal Naval Air Service.

THE following appeared among the Admiralty announcements of the 11th inst. :—

Mate (Flight-Lieut.) F. J. Rutland promoted to the rank of Lieutenant, with seniority of Jan. 7th.

Chief Petty Officer (3rd Grade) H. G. P. Browne promoted to Warrant Officer (2nd Grade), for temporary service, with seniority of Jan. 7th, and appointed to "President," additional, for R.N.A.S. Surgeon Probationer (R.N.V.R.) G. Donald entered as Probationary Flight Sub-Lieutenant, with seniority of Jan. 10th, and appointed to "President," additional, for R.N.A.S.

W. R. Stennett entered as Temporary Sub-Lieutenant (R.N.V.R.), with seniority of Jan. 10th, and appointed to "President," additional, for R.N.A.S.

The following appeared among the Admiralty announcements of the 12th inst. :—

Probationary Flight Sub-Lieut. the Hon. N. G. H. Sturt, B. C. Tooke, and J. J. de la T. Fox all confirmed in the rank of Flight Sub-Lieutenant, with original seniority, and reappointed to "President," additional, for R.N.A.S. To date Nov. 29th, Dec. 18th, and Jan. 1st respectively.

The undermentioned Probationary Flight Sub-Lieutenants (temporary) have been confirmed in the rank of Flight Sub-Lieutenant, with original seniority, and all reappointed to "President," additional, for R.N.A.S., to date as follows: E. T. Bradley and G. L. E. Stevens; both Dec. 6th. L. P. Paine and C. A. Eyre; both Dec. 14th. G. H. Bettinson; Dec. 18th. T. R. Hackman, T. G. M. Stephens, R. A. Courtage, C. H. Darley, and G. Moore; all Dec. 21st. J. A. Sparrow and H. E. C. Plowden; both Dec. 22nd. C. Murray; Dec. 23rd. R. E. Dean, H. C. G. Allen, and H. L. E. Tyndale-Biscoe; all Dec. 24th. W. M. Tait; Dec. 27th. E. M. King, H. G. Page, F. C. Henderson, F. A. R. Malet, G. A. Maclean, W. R. Dainty, and W. Man; all Dec. 30th. R. S. W. Dickinson; Dec. 31st.

T. C. Lloyd entered as Probationary Flight Sub-Lieutenant, with seniority of Jan. 4th.

G. R. Moody granted a commission as Temporary Lieutenant (R.N.V.R.), with seniority of Jan. 11th, and appointed to "President," additional, for (E.) duties with the R.N.A.S. (appointment as Probationary Flight Sub-Lieutenant, temporary, terminated).

G. P. C. Greene and J. C. A. Jenks both entered as Temporary Sub-Lieutenants (R.N.V.R.), with seniority of Jan. 11th.

The following appeared among the Admiralty announcements of the 14th inst. :—

Flight-Commander J. D. Maude to the "Empress." To date Jan. 13th.

M. F. Browne entered as Sub-Lieut., R.N.V.R., for temporary service, and appointed to "President," additional. To date Jan. 13th.

The following appeared among the Admiralty announcements of the 15th inst. :—

E. E. Wallington Batt granted a temporary commission as Sub-Lieut., R.N.V.R., and appointed to "President," additional, for R.N.A.S. To date Jan. 14th.

E. J. Travers entered as Sub-Lieut., R.N.V.R., and appointed to "President," additional, for R.N.A.S. To date Jan. 5th.

The following have been entered as Probationary Flight Sub-Lieutenants (temporary), and appointed to "President," additional, for R.N.A.S., to date as mentioned: G. P. Powles and O. R. Griffin; Dec. 24th. J. E. Northish; Jan. 14th. R. A. Little; Jan. 18th.

The following appeared among the Admiralty announcements of the 17th inst. :—

Lieut.-Commander A. M. Longmore, to "Tiger," vice Bayley. To date Jan. 16th.

Lieut. (R.N.) R. B. Maycock, to "President," additional, for R.N.A.S. Jan. 16th.

Royal Flying Corps (Military Wing).

THE following appeared in the *London Gazette* of the 11th inst. :—

Equipment Officer.—Second Lieutenant A. M. Low, Special Reserve, from an Assistant Equipment Officer, and to be Temporary Captain whilst so employed. Dec. 22nd, 1915.

Supplementary to Regular Corps.—Second Lieut. (on probation) Joseph S. D. Harries-Jones, previously described as H. Jones in the *Gazette* of Dec. 23rd, 1915, is confirmed in his rank.

Second Lieutenants (on probation) confirmed in their rank: Andrew Lang, Samuel J. Sibley, Algernon L. Curtis, Harold R. Lecomber, William D. L. Jupp, Stanley Davenport, Cecil T. Inman, John N. D. Heenan, John N. Mearns, Barton Mott, and Robert T. Lattey.

To be Second Lieutenants (on probation): Lieut. John K. Aird, Canadian Militia; Nov. 25th, 1915. John M. Furnival; Dec. 17th, 1915. Cyril G. Jones; Dec. 19th, 1915. Dec. 20th, 1915: Robert E. H. Daniel and Hugh Phillips. Arthur N. Patterson; Dec. 30th, 1915. Jan. 3rd, 1916: Leonard J. Pearce, Graeme F. Blackburn, Ernest H. Johnston, Tancred Hawkins, Charles E. Blayney, Francis McD. C. Turner, Guy S. Thorne, Herbert H. Turk, John Hay, Hugh W. Norman, Leonard R. Kerridge, John F. A. Day, Reginald J. Bennett, and Eric R. Gunner. Seaward N. Cole; Jan. 10th, 1916.

The following appeared in a supplement to the *London Gazette* issued on the 12th inst. :—

Equipment Officers.—From Assistant Equipment Officers, and to be Temporary Captains whilst so employed; Dec. 7th, 1915: Lieut. F. Jolly, Special Reserve; Lieut. Harry F. T. Blowey, R.A.

Flying Officers.—Dec. 23rd, 1915: Lieut. James B. Elliott, Rifle Brigade (Prince Consort's Own), Special Reserve, and to be seconded; Lieut. Ralph N. Adams, Royal Fusiliers (City of London Regt.), Special Reserve, and to be seconded; Second Lieut. (Temporary Lieut.) C. I. Burrell, R.E. (T.F.); Second Lieut. (Temporary Lieut.) A. F. K. White, Suffolk Regt. (T.F.). Temporary Second Lieut. G. S. Bush, Prince Albert's (Somerset L.I.), and to be transferred to the General List. Second Lieuts., Special Reserve; Dec. 23rd, 1915: Andrew Lang and Alan Goodfellow. Dec. 29th, 1915: Frederick J. H. Thayer, Thomas C. Wilson, and Robert K. Shives. Dec. 30th, 1915: Robert A. Logan, Second Lieut. M. A. A. Lillis, Royal Irish Regt., and to be seconded.

Assistant Equipment Officers.—Second Lieutenants, Special Reserve: W. C. Green; Nov. 10th, 1915. William H. Date; Nov. 18th, 1915. Eustace S. Perrin; Nov. 19th, 1915. Morton C. Evans; Nov. 21st, 1915. Dec. 1st, 1915: Alfred E. Thorne and Clement Hirtzel. Dec. 6th, 1915: Lieut. (Temporary Capt.) C. E. Gardner, Gloucestershire Regt. (T.F.); Second Lieut. (Temporary Lieut.) A. Cleghorn, R.E. (T.F.); Second Lieut. W. R. Bruce-Clarke, London Regt. (T.F.). Second Lieutenants, Special Reserve: Algernon L. Curtis, William W. Stenning, and Thomas G. G. Bolitho. Dec. 9th, 1915: Temporary Lieut. E. R. Bond, Welsh Regt., and to be transferred to the General List; Temporary Second Lieut. G. E. L. Woodhouse, Essex Regt., and to be transferred to the General List. Second Lieutenants, Special Reserve: Richard K. C. Maguire; Dec. 9th, 1915. Dec. 12th, 1915: Sewell Alenby. Gerald Jacques. Robert T. Lattey; Dec. 13th, 1915. Dec. 15th, 1915: Barton Mott and William D. L. Jupp. Dec. 20th, 1915: Lieut. G. L. Wightman, The Gordon Highlanders, and to be transferred to the General List. Temporary Lieut. A. J. Boulter, Leicestershire Regt., and to be transferred to the General List. Second Lieut. (Temporary Lieut.) G. W. Swanson, The Hampshire Regt. (T.F.). Second Lieut. J. H. Rutherford, London Regt. (T.F.). Temporary Second Lieut. H. B. Denton, R.E., and to be transferred to the General List. Second Lieuts., Special Reserve; Dec. 20th, 1915: Harold R. Lecomber, Charles G. Coe, Stanley Davenport, John N. D. Heenan, Joseph S. D. Harries-Jones, Cecil T. Inman, and John N. Mearns. Lieut. Harold MacD. O'Malley, Special Reserve, from a Flying Officer; Dec. 24th, 1915. Second Lieut. H. F. Anns, London Regt. (T.F.); Dec. 29th, 1915.

Supplementary to Regular Corps.—Second Lieutenants (on probation) confirmed in their rank: Robert A. Logan, Frederick J. H. Thayer, Alan Goodfellow, Thomas C. Wilson, Robert Kilgour Shives, Clement Hirtzel, and Ernest H. Robinson.

To be Second Lieutenants (on probation): Arthur N. Buchanan; Oct. 29th, 1915. Dec. 20th, 1915: Henry P. Boot, John D. Troup, John A. Gibson, Oswald V. Thomas, Lionel A. Clayton, and John G. Hutt.

The following appeared in a supplement to the *London Gazette* issued on the 13th inst. :—

Squadron-Commander from Flight Commander.—Major A. B. Burdett, York and Lanc. Dec. 17th.

Flight-Commanders from Balloon Officers.—Capt. F. H. Shaw, W. Riding Divl. Train, A.S.C. (T.F.); Dec. 18th. And to be

Temporary Captains whilst so employed: Temporary Lieut. A. H. Parker, General List; Dec. 18th. From Flying Officers; Dec. 20th: Second Lieut. (Temporary Lieut.) R. A. Saunders, R.F.A. (T.F.); Second Lieut. A. T. Whitelock, S.R.; Capt. J. A. Chamier, 33rd Punjabis, I.A.; Dec. 29th Capt. H. Wyllie, Hants (T.F.); Oct. 14th. And to be Temporary Captains whilst so employed; Dec. 27th: Lieut. W. S. Douglas, R.F.A., S.R.; Lieut. A. M. Morison, S.R.

The following appeared in the *London Gazette* of the 14th inst. :—
Equipment Officer.—Second Lieut. (Temporary Lieut.) P. H. Linthune, London (T.F.), from Assistant Equipment Officer, and to be Temporary Captain whilst so employed. Dec. 30th.

Flying Officers.—Jan. 1st: Lieut. R. H. B. Ker, Can. Local Forces; Second Lieut. Henry O'N. de H. Segrave, R. Warwicks, and seconded.

Wing-Adjutant.—Capt. C. F. Gordon, N. Staffs., and seconded, vice Capt. B. C. Fellows, ret., I.A. Dec. 18th.

Assistant Equipment Officer.—Second Lieut. F. M. I. Watts, Worcs., and seconded. Dec. 30th.

Supplementary to Regular Corps.—To be Second Lieutenants (on probation); Dec. 13th: H. H. Baron, E. F. Allen, and C. A. Lewis. Dec. 15th: C. J. Creery and E. S. Duggan. E. Duveen; Dec. 22nd. P. D. Rader; Dec. 28th.

Honours for the R.F.C.

In the long list of honours and promotions for services rendered in connection with military operations in the field, published in a special supplement to the *London Gazette*, dated January 14th, there were the following relating to the R.F.C. :—

The King has been graciously pleased to give directions for the following appointments to the Most Distinguished Order of Saint Michael and Saint George, for services rendered in connection with military operations in the field, to be dated January 1st, 1916:

To be Additional Members of the Third Class or Companions of the said Most Distinguished Order.

Lieutenant-Colonel EDWARD BAILEY ASHMORE, M.V.O., R.A. and R.F.C.

Major FRANCIS LEYCESTER FESTING, Northumberland Fus. and R.F.C.

His Majesty the King has been graciously pleased to approve of the undermentioned Honours and Rewards for distinguished service in the field, with effect from January 1st, 1916, inclusive:

To be Brevet Majors.

Captain (Temporary Major) D. S. LEWIS, D.S.O., R.E., and R.F.C.

Captain (Temporary Major) G. S. SHEPHERD, Royal Fusiliers and R.F.C.

To be Companions of the Distinguished Service Order.

Major RALPH LONGSTAFF, R.A., attached R.F.C.

Captain HENRY LE MARCHANT BROCK, R. Warwickshire Regt. and R.F.C.

Captain JOHN GLANVILLE HEARSON, R.E. and R.F.C.

Awarded the Military Cross.

Captain HAROLD BLACKBURN, Royal Flying Corps (Special Reserve).

Captain JAMES LEE JACKSON, Connaught Rangers (Special Reserve) and R.F.C.

Captain (Temporary Major) EDGAR RAINEY LUDLOW-HEWITT, Royal Irish Rifles and R.F.C.

Lieutenant (Temporary Captain) ARTHUR SHERIDAN BARRATT, R.A. and R.F.C.

Lieutenant (Temporary Captain) WILLIAM CLAUD KENNEDY BIRCH, Yorkshire Regt. and R.F.C.

Lieutenant WILLIAM SHOLTO DOUGLAS, R.A. (Special Reserve) and R.F.C.

Temporary Lieutenant ALFRED JOHN EVANS, Special List (attached R.F.C.).

Lieutenant (Temporary Captain) JOHN LAWSON KINNEAR, Liverpool Regt. and R.F.C.

Temporary Lieutenant AUBREY HASTINGS PARKER, Punjab Volunteer Rifles and R.F.C.

Lieutenant (Temporary Captain) PATRICK HENRY LYON PLAYFAIR, R.A. and R.F.C.

Lieutenant (Temporary Captain) WILLIAM RONALD READ, 1st Dragoon Guards and R.F.C.

Lieutenant (Temporary Captain) CHARLES EDMUND RYAN, R.A. and R.F.C.

The following appeared in a supplement to the *London Gazette* issued on the 15th inst. :—

Flight-Commander.—Temporary Lieut. H. Whitaker, R.E., from Balloon Officer, and to be Temporary Captain whilst so employed. Dec. 3rd.

The following appeared in a supplement to the *London Gazette* issued on the 17th inst. :—

Flight Commanders (from Flying Officers, and to be Temporary Captains whilst so employed).—Temporary Second Lieut. C. S. Wynne-Eyton, General List; Dec. 30th, 1915. Temporary Second Lieut. J. C. Quinell, R.A., and Second Lieut. H. A. Cooper, Special Reserve; Jan. 1st, 1916.

Supplementary to Regular Corps.—Second Lieut. (on probation) Francis C. Buck is confirmed in his rank. To be Second Lieutenants (on probation): Ernest L. Pegge, Alexander J. Rickie, Keith D. Abercromby, and John Armes; Dec. 27th, 1915. Robert K. Muir: Dec. 28th, 1915.

Royal Flying Corps (Territorial Force).

The following appeared in a supplement to the *London Gazette* issued on the 12th inst. :—

Hampshire Aircraft Parks, R.F.C.—The Christian names of Temporary Lieut. Reginald M. S. Maxwell are as now described, and not as previously notified.

Temporary Lieutenant HERBERT MARTIN SISON, A.S.C. and R.F.C.

Lieutenant ALASTAIR SOMERVAIL, K.O. Sco. Bord. (T.F.) and R.F.C.

Second Lieutenant (Temporary Lieutenant) WILLIAM HENRY DYKE ACLAND, R. Devon Vco. (T.F.) and R.F.C.

Temporary Second Lieutenant (temporary Captain) EWART DOUGLAS HORSEFALL, Rifle Brig. (Service Battalion) and R.F.C.

Second Lieutenant (Temporary Captain) ERIK HARRISON MITCHELL, R.A. and R.F.C.

Second Lieutenant (Temporary Lieutenant) REGINALD ARTHUR SAUNDERS, R.A. (T.F.) and R.F.C.

Australian Force.

Captain HENRY PETRE, Aeroplane Section.

Awarded the Distinguished Conduct Medal.

1st Class Air-Mechanic F. HARTLEY, Royal Flying Corps.

Corporal E. P. ROBERTS, Royal Flying Corps.

Sergeant A. SCOTT, Royal Flying Corps.

Sergeant F. V. WRIGHT, Royal Flying Corps.

Reward for Brave C.P.O.

In the *London Gazette* of the 14th inst., it was announced that the King had been pleased to approve of the Albert Medal of the Second Class being conferred upon MICHAEL SULLIVAN KEOGH, Chief Petty Officer, H.M.S. "Ark Royal," in recognition of his gallantry in endeavouring to save life as detailed below :—

On August 19th, 1915, an aeroplane, piloted by the late Captain C. H. Collet, D.S.O., R.M.A., was ascending from Imbros Aerodrome, and had reached a height of 150 ft., when the engine stopped. The machine was upset by the powerful air currents from the cliffs, and fell vertically to the ground, while the petrol carried burst into flames, which immediately enveloped the aeroplane and pilot.

Chief Petty Officer Keogh, upon arriving at the scene of the accident, at once made an attempt to save Captain Collet by dashing into the midst of the wreckage, which was a mass of flames. He had succeeded in dragging the fatally injured officer nearly clear of the flames when he was himself overcome by the burns which he had received from the blazing petrol.

R.N.A.S. Work on the Belgian Coast.

In a despatch from Vice-Admiral R. H. S. Bacon, Commanding the Dover Patrol, issued on January 12th, and covering the period from August 22nd to November 19th, there is the following reference to the work of the R.N.A.S. :—

"Throughout these operations attacks have been made on our vessels by the enemy's aircraft, but latterly the vigilance of our Dunkirk Aerodrome, under Wing-Commander A. M. Longmore, has considerably curtailed their activity."

The following officer is commended for service in action :—

Flight-Commander F. K. HASKINS, R.N.A.S., Dunkirk.

AN AMERICAN BATTLE-PLANE.

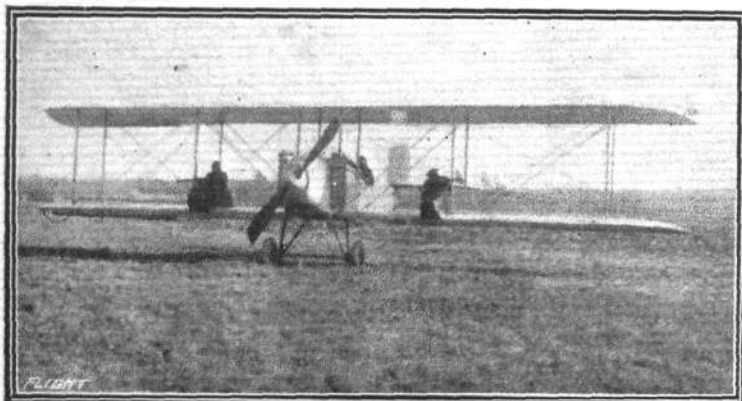
FURTHER details are now to hand regarding the Sturtevant biplane, of which a photograph appeared in our last issue. From the following details, which are given in our American contemporary *Aerial Age*, it will be seen that it is proposed to mount two guns, one on each side of the fuselage:—

"On December 12th remarkable flights made at Read-

"It is interesting to note that the machine was completely designed before construction, and extensive aerodynamic tests were made of the model of this machine by Naval Constructor Jerome C. Hunsaker, in charge of the Aeronautical Engineering course at the Massachusetts Institute of Technology, which gave excellent information on the stability and controllability of the machine. Constructed as designed, the machine actually did more than was anticipated.

"In the Sturtevant Battle-plane the single motor tractor that has been puzzling aviation experts is made into a simple effective fighter, by the novel idea of placing a gun turret on either side of the body, as shown in the illustrations, a development which, though obviously simple, nevertheless required considerable effort to work out satisfactorily. These gun turrets, in each of which a gunner observer is located, are placed out on the wings, with an excellent clear view ahead and below and a range for gun fire on all sides, with the added advantage that two guns can be concentrated forward with deadly effect. In addition to that a broadside of both guns can be obtained by tilting the machine laterally, a feature which for a long time escaped attention of aviation experts.

"It is true that in the two motor machines there is a

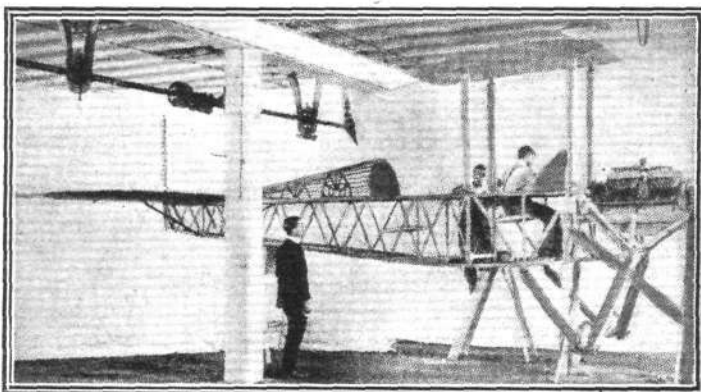


Front view of the Sturtevant Battle biplane showing the gun "turrets" mounted on either side of the body.

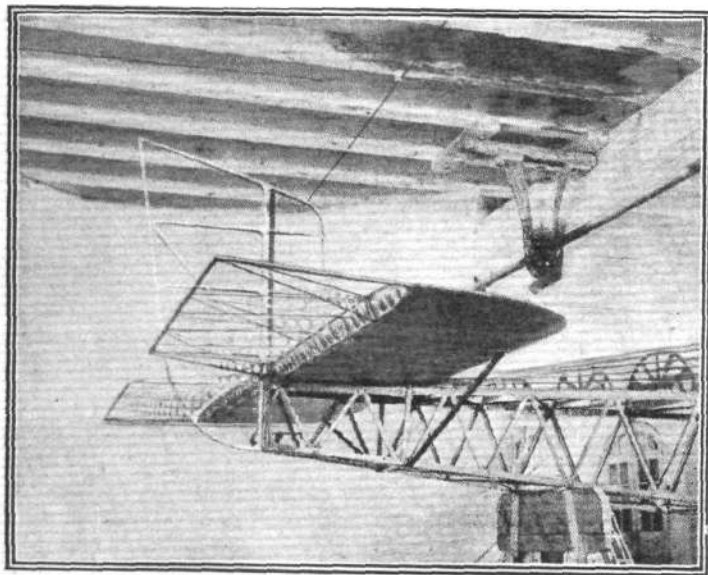
ville, Mass., by one of the U.S. Army expert aviators, revealed to the public for the first time that a notable development in aviation had quietly been made by the Sturtevant Aeroplane Company under the direction of Mr. Grover C. Loening, B.Sc., M.A., C.E., former Aeronautic Engineer of the U.S. Army, author of 'Military Aeroplanes' and other important technical works.

"As the accompanying illustrations show, the Sturtevant Battle-plane is a biplane of tractor type built with remarkable simplicity and with studied attention to efficiency.

"There are many novel features, including the steel construction, the placing of gun turrets on either side of the central body, the elimination of wires, the general



View of the body of the Sturtevant Battle biplane showing the steel construction.



View showing the tail plane and construction of the elevators of the Sturtevant Battle biplane.

streamline construction which has been carried as far as to having even the cables and turnbuckles in streamline. The span of the machine is 50 feet, the length 25 feet; it has a total area of 700 square feet of wing surface.

small degree of safety in having one motor still running when the other has been hit, so it is equally true that in the new Sturtevant Battle-plane a gunner is still hitting away when the other has been disabled.

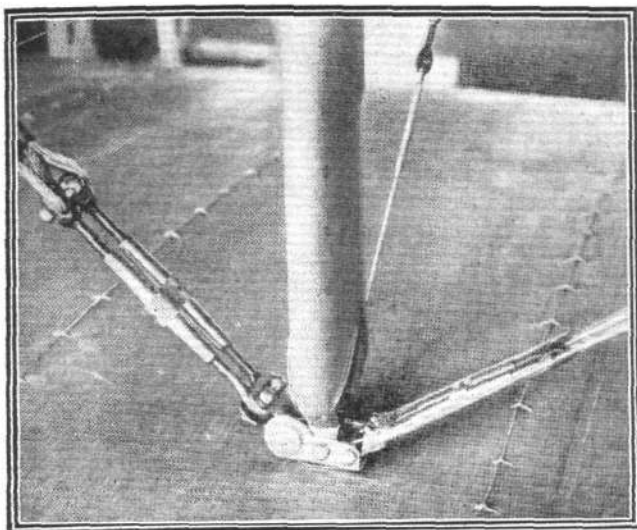
"Due to the better load distribution, the safety factor of this new machine has been shown by tests to be 12 times the flying load. Another feature which is novel is that the gun turrets are readily removable, so that by decreasing the head resistance and the load, the same machine is interchangeable into a high speed, scouting type with great excess power for climbing and cruising radius of over 500 miles.

"Very little data on the performances of this machine are disclosed by the manufacturer, but it is said to have a gasoline capacity of almost 150 gallons, sufficient for 12 hours' flight and to carry a total live load of over 1,200 pounds. The efficiency of this new machine is said to be considerably higher than has been previously attained in this country, due to having all the wires and fittings 'streamlined' (made torpedo shape to reduce head resistance). This, however, is a development that has come to be standard practice abroad.

"It is interesting to note that the gun turrets could be used for carrying mail, and measuring 2 ft. wide by 7 ft. long, they could carry over 24 cub. ft. of mail. One of

the most novel features in the construction of this new craft is the use of a new type of vanadium steel construction, lighter than wood, more durable, fireproof, and capable of being extended into aeroplanes ten times the size of this huge bird.

"Several hundred pounds of bombs can be carried on this new fighting flyer, and with its gunners to ward off



The neat attachment of the bracing cables to the interplane strut on the Sturtevant Battle biplane.

other aeroplanes, these destructive missiles could be dropped with impunity on a helpless city. There is little doubt that large squadrons of craft of this kind could paralyse a nation's industry, and from what has already been done in Europe, and the indications of what is coming, it is reasonable to predict that the colossal war in Europe will end in the air—in tremendous battles of huge air navies engaged in the destruction of cities, railroads, and even armies.

THE ROLL OF HONOUR.

THE Secretary of the Admiralty announces the following casualties:—

Under date January 10th:

Killed.

Probationary Flight Sub-Lieutenant Gordon E. Duke, R.N.
Warrant Officer (2nd Grade) Percival V. Fraser, R.N.A.S.

Under date January 11th:

Killed.

Flight Sub-Lieutenant Cecil Horace Brinsmead, R.N.

Under date January 12th:

Missing.

Flight Sub-Lieutenant James S. Bolas, R.N.
Midshipman Douglas M. Branson, R.N.

The following casualties in the Expeditionary Force have been officially reported from General Headquarters:—

Under date January 2nd:

Missing.

Sergeant E. Jones, Royal Flying Corps.

Ten Aeroplanes from Malay States.

THE Secretary of State for the Colonies announces that sums exceeding £15,000 have been collected in the Straits Settlements and the Federated Malay States for the purchase of aeroplanes for the use of the Royal Flying Corps. The organiser of the fund, Mr. C. Alma Baker, of Kinta, is himself the donor of one aeroplane. Funds for the provision of ten aeroplanes, which will be numbered "Malaya 1" to "Malaya 10," have already been gratefully acknowledged by the War Office.

Subscriptions were received from all nationalities in the Malay



The 140 h.p. Sturtevant Battle biplane in flight.

"While the Sturtevant Battle-plane is but a step in the development of these mighty fleets, it is a remarkable indication of the trend of aeroplane progress, and, more important than all, it has been designed primarily for Uncle Sam."

Under date January 6th:

Died of Wounds.

Captain J. G. D. Sanders, R.F.A. and R.F.C.

Missing.

Lieutenant G. C. Formilli, R.G.A., attached R.F.C.

Lieutenant A. L. Russell, Royal Flying Corps.

Second Lieutenant W. E. Somervell, L. N. Lancs. R., and R.F.C.

Under date January 11th:

Missing.

Second Lieutenant F. Adams, Royal Flying Corps.

Second Lieutenant J. G. McEwen, Royal Flying Corps.

Previously Officially reported Missing, now Unofficially reported Killed.

Second Lieutenant L. W. Yule, Royal Flying Corps.

The following casualties among the Indian Forces with the Expeditionary Force are reported:—

Undated:

Previously reported Missing, now reported Killed.

Second Lieutenant D. F. Cunningham Reid, Indian Army Reserve of Officers, attached R.F.C.

Peninsula, several of the aeroplanes being presented by the Chinese residents.

Paulhan Mentioned in Despatches.

M. PAULHAN, who was attached to the French Military Mission in Serbia, has again been mentioned in Army Orders. The latest citation is as follows: "After having pursued enemy aeroplanes that had just effected a bombardment this officer pursued one of the machines that he had defeated in a battle, where he showed the greatest coolness. He hovered over the machine, which fell in the enemy's country, to drop a bomb on it."

A "POPULAR" TYPE AEROPLANE DESIGN.

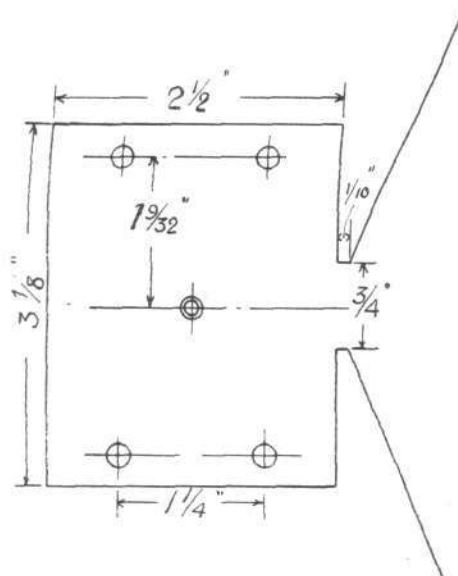
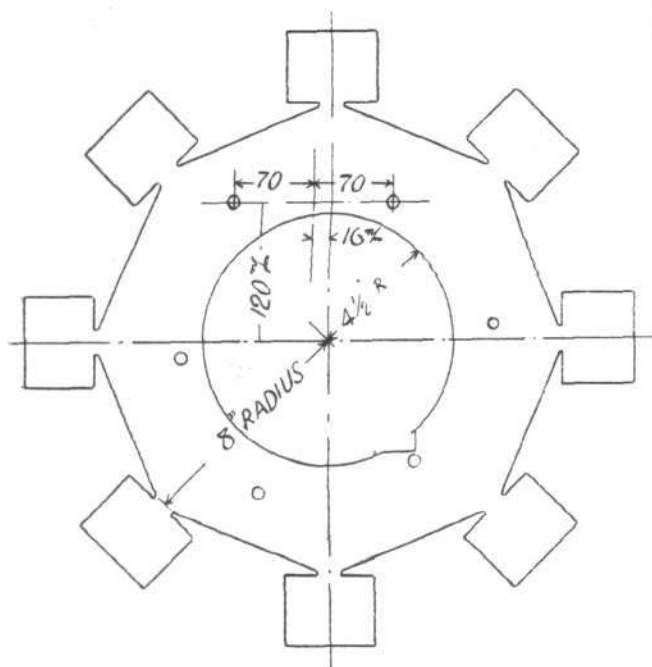
By C. M. POULSEN.

(Continued from page 37.)

FROM the diagram of the model of B.F. 36, published in the first instalment of this article, the outline of the body of our suggested design for a popular type aeroplane is plotted as nearly as is conformable with practical considerations. This done, suitable *longerons* and formers have to be chosen. For the *longerons* I

and former No. IV. The close proximity of these two is caused by the staggering of the planes, which necessitates some form of support for the centre section of the top plane.

From an admittedly very rough estimate of weights and moments, the spacing of formers Nos. II, III, IV, and V should be approximately correct, and may be taken as representing sufficiently accurately for the moment the positions of the spars of lower and upper



THE ENGINE PLATE FOR THE 30 H.P. ANZANI.—On the right is shown to a larger scale the clips of the engine plate which are to be bent over the *longerons*.

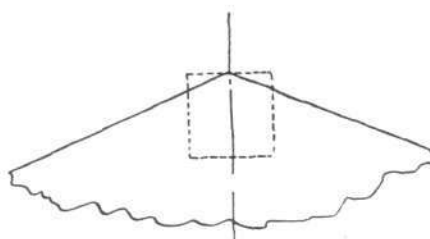
suggest spruce $\frac{3}{4}$ in. square from the engine plate to just behind former No. V, where those of the front part are joined by splicing and binding to those of the rear portion. From this joint we shall let the *longerons* taper to $\frac{1}{2}$ in. square at the tail piece in order to save weight. It might be objected that *longerons* $\frac{3}{4}$ in. square in front tapering to $\frac{1}{2}$ in. square at the rear will be none too strong, but it should be remembered that, although in the ordinary machine a fair average size for the longitudinal members would be about $1\frac{1}{4}$ in. square tapering to $\frac{3}{4}$ in. square, there are eight *longerons* in our suggested machine as against the usual four, and that consequently each of them can be made a good deal lighter. Besides, with an octagonal section a load or pressure applied at any point is distributed over the whole structure.

As regards the formers which support the longitudinals, it has already been decided to use three-ply wood for these, and a suitable thickness would, I think, be $\frac{1}{4}$ in. We shall therefore decide to use this thickness for all the formers, and strengthen those in front, where the heaviest loads are carried and where consequently greater strength is required, by leaving them wider from the side of the polygon to the periphery of the circle. Ample strength should be provided if this distance is 3 ins. in the first five formers, as shown in the accompanying illustrations.

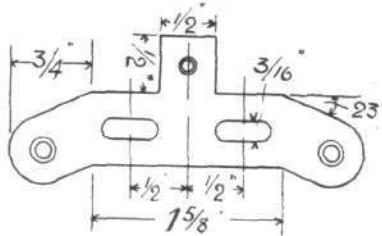
The next one we shall make $2\frac{1}{2}$ ins. and the next again $2\frac{1}{4}$ ins., all the remaining being 2 ins. With the spacing of the formers suggested in the drawing the angle of the bracing wires in the different bays remains fairly constant, with the exception of the bay between former No. III,

planes, the bottom wing spars being supported on the formers numbered III and V, while the centre section of the top plane is supported, *via* vertical struts, on formers Nos. II and IV.

As to the exact method of attaching the lower wing

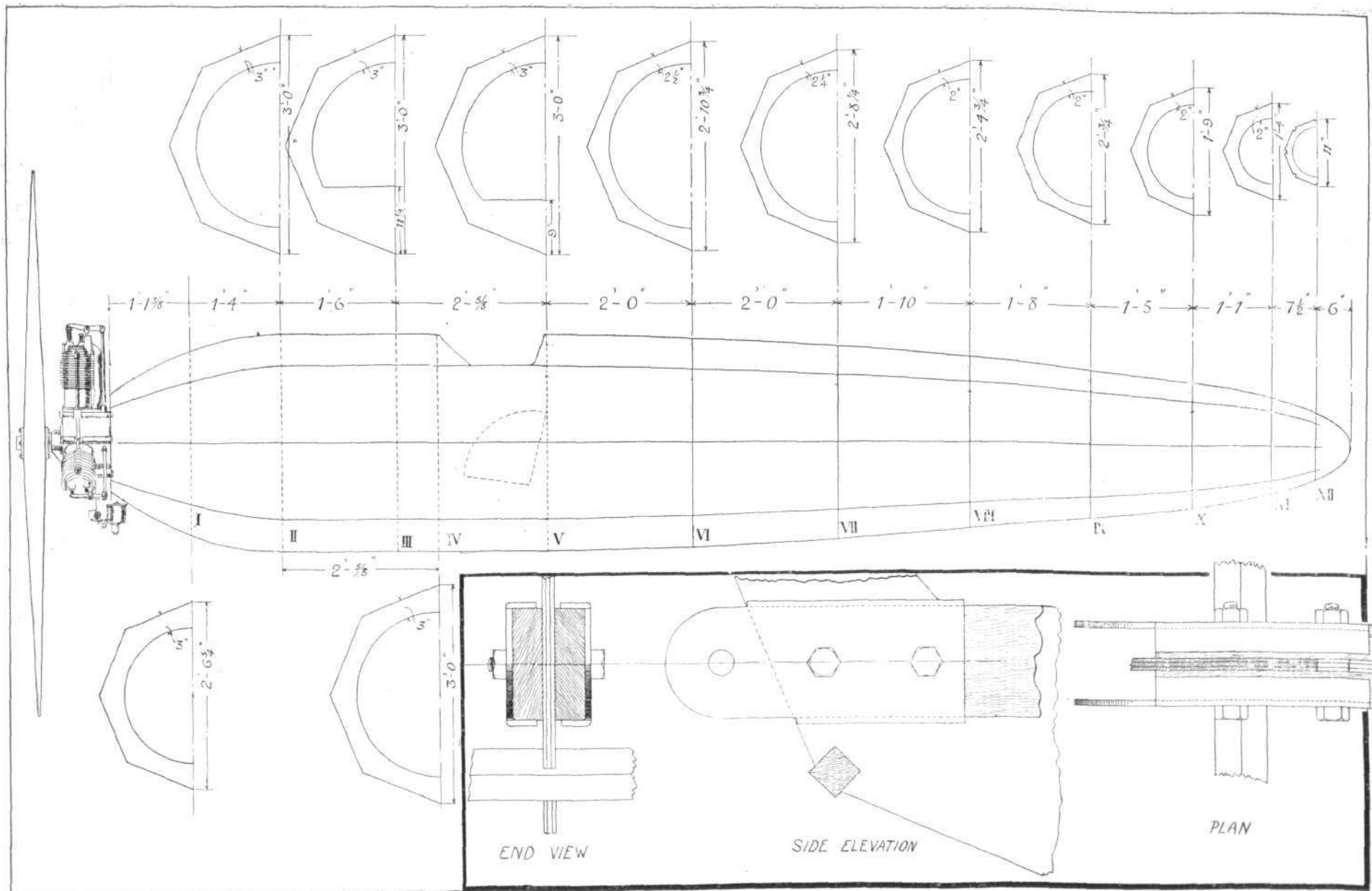


Sketch showing how notches for *longerons* are measured off from the points of the octagons.



Template with dimensions for the wiring plates in the rear part of the fuselage. To be made of 14 gauge sheet steel. Similar wiring plates can be used in front, but should here be made of 12 gauge steel.

spars to their respective formers, this is shown in the inset of the large drawing. Instead of cutting a complete circle out of each of these two formers, the lower portion of the three-ply wood is left in place for a height of 9 ins. in No. V, and $11\frac{1}{4}$ ins. in No. III, the difference in height being, of course, due to the angle of incidence. Running right across the fuselage from side to side is a compression member composed of two



DIMENSIONED DIAGRAM OF THE FUSELAGE AND FORMERS.—Inset: Attachment of lower rear spar to three-ply former.

halves, one on each side of the three-ply former, and so proportioned as to make, in connection with the three-ply, a short compression spar of the same outside dimensions as the corresponding wing spar, with the exception that it is of rectangular section. Mounted on each end of this compression spar are two 10-gauge steel plates of the shape shown, bent over the top and bottom of the spar so as to partly enclose it, and held in place by two $\frac{5}{16}$ -in. bolts passing through the plates, the two halves of the spar, and the three-ply former. A third bolt in the centre of the spar, half-way between the sides of the body, completes the attachment of the compression member to the fuselage. The weight of the body, it will be seen, is, therefore, not only taken by the bolts, but as these clamp the two halves of the compression spar tightly to the three-ply, the load is distributed right across the lower portion of the three-ply former, and, hence, through the bracing wires to the rest of the body. Corresponding plates on the inner ends of the wing spars will furnish the other half of the hinge by means of which these are pivoted to the sides of the body.

In the half-sections I have not shown the notches for the longerons, as the size varies in the rear part according to the taper of the longerons, and therefore can best be obtained by actual measurements. I have drawn the points of the octagons where the outer side of the longerons should come, and by measuring off from this point towards the centre of the octagon the particular depth of the longeron, the right position is easily found. This method, which is illustrated in one of the accompanying sketches, will give just sufficient clearance between the sides of the octagonal formers and the fabric covering.

As regards seating accommodation for the pilot, I suggest slinging the seat on wires with which are incorporated strainers, since this form is very light and has the further advantage of affording easy means of adjusting the position of the seat both vertically and longitudinally.

At the outset it was decided to attempt to obtain a speed variation of from 35 to 65 m.p.h., with a 30 h.p. engine, and we must therefore choose a suitable engine of this power. The number of types available is somewhat restricted, on account of the comparative scarcity of makers who produce good reliable engines of so low power. In the 30 h.p. 3-cylinder Y type Anzani we have, however, an engine which has stood the test of time, and proved its worth under unfavourable conditions on machines in use for instruction work, where it has to run for quite long periods with the machine travelling very slowly. In spite of the necessarily in-

sufficient cooling, the Y Anzani runs very well, and it is therefore to be supposed that at the higher speed that we hope to obtain, it will be working under much more favourable conditions, and so with better efficiency. In addition to its relatively low cost, the 30 h.p. Anzani has the further advantage that, owing to its cylinders being arranged radially, it lends itself extremely well to being mounted in a circular or polygonal section fuselage.

When designing a mounting for the Y type Anzani engine it should be borne in mind that its three cylinders are slightly off-set—16 mm., to be exact—so that the two bolt holes (13 mm. diameter) of the upper cylinder are 16 mm. to the left (when seen from in front) of the vertical diameter of the engine plate. The same applies, of course, to the other two cylinders. In two of the accompanying sketches is shown a suggested design for an engine plate. It looks at first, I am afraid, somewhat terrifying, but will in reality, I think, be found to be a comparatively simple one to make, and should be quite effective. The rectangular pieces projecting radially from the main plate are of course to be bent over the front end of the longerons, being secured on the outside by a wood screw and clamped to the sides of them by two $\frac{5}{16}$ in. bolts passing inside the longerons. When the bolts are tightened up they will grip the longerons between the two flanges without piercing them. The inner of the two bolts will, in addition, serve as an anchorage to the bracing wires running to the former numbered 1 in the side view of the fuselage.

In order to get the lower longeron clear of the carburettor, it has been necessary to make these members converge rather abruptly in front of the first three-ply former, thereby deviating rather considerably from the form of B.F. 36. It is improbable, however, that the increase in head resistance caused by this sudden converging of the longerons will be of such magnitude as to justify one in going to extra trouble and expense in order to adhere more closely to the original form. In the same way the brake in the gentle curve caused by having the longerons parallel for some distance in the neighbourhood of the wing attachment and pilot's seat will probably not add greatly to the head resistance, while being of considerable advantage from a constructional point of view.

Having now got out a rough design for our fuselage, with pilot's quarters, engine, engine mounting, &c., we can begin to calculate our various items of weight in order to find the weight of our machine minus wings, chassis and tail planes, and to begin our hunt for the elusive centre of gravity.

(To be continued.)

Brig.-General Seely's Gift to the R.F.C.

It is announced that Brooke Hill, Isle of Wight, the fine new residence built by the late Sir Charles Seely, has been placed at the disposal of the Royal Flying Corps by Brig.-General J. E. B. Seely, M.P., to be used as an officers' convalescent home. It will be opened almost immediately.

The New Fokker Monoplanes.

The following particulars of the latest Fokker monoplanes now being used by the Germans on the Western Front, were sent from Paris by the *Morning Post* correspondent on January 12th:—

"The special feature of the Fokker monoplane is that its construction is based on steel tubes covered as a protection against rust by something of the nature of waxed canvas. The tubes are rectangular in section, and are closed at the rear in knife edges. The wings are not of the Taube model, but are copied from the French monoplane type. The motor is armoured, and usually of 150 h.p. It is stated that a speed of 110 miles an hour can be attained, and that a height of 7,500 ft. can be reached in 10 mins.

The monoplane is designed to carry one person, who is armed with a machine-gun, and is so arranged that the pilot can shoot through the propeller straight in front of him. It seems that in all essential points they contain no advantages not present in French models.

"The machines have hitherto been kept well in rear of the German lines, and are intended to attack French machines when out on reconnaissance work. The method adopted is to wait until a French machine is seen approaching. Orders are then telegraphed to the German pilot to go up and wait for the arrival of the French machine, and then to attack it direct. Apparently, however, the Fokker monoplanes are only used in cases of extreme necessity, as they require large quantities of petrol and oil, both of which are becoming very scarce."

According to the Parisian correspondent of the *Daily Mail* the monoplanes carry two machine guns, each having a belt of 250 cartridges. He adds that these machine guns are no match for the new revolver gun firing 2.6 in. shrapnel shell now fitted on the French battle-planes.

ROYAL AERO CLUB OF THE U.K.

OFFICIAL NOTICES TO MEMBERS.

SPECIAL COMMITTEE MEETING.

A SPECIAL MEETING of The Committee was held on Tuesday, the 18th inst., when there were present:—Prof. A. K. Huntington in the Chair, Mr. Griffith Brewer, Mr. Ernest C. Bucknall, Commander C. R. Samson, R.N., and the Assistant Secretary.

Election of Members.—The following New Members were elected:—

Charles Neville Brand.
Second Lieut. Guy Herbert Boisragon Dent (2/1st Herts Yeomanry).
Henry Cyril Warneford Foster.
Ewart James Garland.
Lieut. Benjamin Henry Noel Hans Hamilton, R.N.V.R.
Sub-Lieut. Lionel Middleton, R.N.V.R.
John Donald Podmore.
Clifford Baumont Prodger.
Lieut. Harley Alec Tweedie, 10th Hussars.
Magnus Herman Volk.

Re-election of Members.—It was unanimously resolved:

"That the members elected between November 1st, 1914, and October 31st, 1915, be re-elected under Rule 39."

Aviators' Certificates.—The granting of Aviators' Certificates Nos. 2,188 to 2,253 was confirmed.

The granting of the following Aviators' Certificates was confirmed:

- 2254 Lieut. Frank Hubert McNamara (47th Infantry) (Bristol Biplane, Central Flying School, Warrabee, Australia). Oct. 20th, 1915.
2255 Edmund Sidney Duggan (Curtiss Biplane, Curtiss School, Toronto, Canada). Dec. 10th, 1915.
2256 Capt. Geoffrey Aste, A.S.C. (Maurice Farman Biplane, Military School, Norwich). Dec. 20th, 1915.
2257 Lieut. Ernest Leslie Foot, R.F.C. (Maurice Farman Biplane, Military School, Farnborough). Dec. 20th, 1915.
2258 Flight Sub-Lieut. Kenneth Carron Buss, R.N.A.S. (Maurice Farman Biplane, Royal Naval Air Station, Chingford). Jan. 9th, 1916.
2259 Francis Steele Moller (Maurice Farman Biplane, Military School, Shoreham). Jan. 9th, 1916.
2260 Second Lieut. Eustace Montague Lafone Ainslie (1/8th Middlesex Regt.) (Maurice Farman Biplane, Military School, Farnborough). Jan. 9th, 1916.
2261 Capt. William Howard Nicholls, R.A.M.C. (S.R.) (Maurice Farman Biplane, Military School, Norwich). Jan. 9th, 1916.
2262 Harry Smart (Maurice Farman Biplane, Military School, Brooklands). Jan. 9th, 1916.
2263 Capt. David Benjamin Gray (48th Pioneers) (Hall Biplane, Hall School, Hendon). Jan. 10th, 1916.
2264 Oliver Cyril Godfrey (Beatty-Wright Biplane, Beatty School, Hendon). Jan. 12th, 1916.
2265 Basil Holdsworth Hunt (L. and P. Biplane, London and Provincial School, Hendon). Jan. 12th, 1916.
2266 William Edwin Thorpe (L. and P. Biplane, London and Provincial School, Hendon). Jan. 12th, 1916.
2267 Second Lieut. Ernest William Edwards (3rd Queen's Regt.) (Maurice Farman Biplane, Military School, Birmingham). Jan. 12th, 1916.
2268 Flight Sub-Lieut. George Stewart Gray, R.N.A.S. (Caudron Biplane, Royal Naval Air Station, Redcar). Jan. 10th, 1916.
2269 Hugh Lewis (Grahame-White Biplane, Grahame-White School, Hendon). Jan. 14th, 1916.
2270 William Archibald Buchanan (Maurice Farman Biplane, Military School, Birmingham). Jan. 14th, 1916.
2271 Flight Sub-Lieut. Ernest Edward Deans, R.N.A.S. (Maurice Farman Biplane, Central Flying School, Upavon). Jan. 14th, 1916.
2272 Harry Alison Nood (Maurice Farman Biplane, Military School, Birmingham). Jan. 14th, 1916.
2273 Alan Alexander Wilson-Walker (Maurice Farman Biplane, Military School, Brooklands). Jan. 14th, 1916.
2274 Patrick Roberts Stirling (Hall Biplane, Hall School, Hendon). Jan. 14th, 1916.
2275 Lieut. David Wilson (11th East Yorkshire Regt.) (Maurice Farman Biplane, Military School, Catterick Bridge). Jan. 14th, 1916.
2276 Second Lieut. Henry Collister Mulock (South Staffordshire Regt.) (Maurice Farman Biplane, Military School, Birmingham). Jan. 14th, 1916.
2277 Lieut. Charles Henry Nicholas (3rd South Wales Borderers) (Maurice Farman Biplane, Military School, Catterick Bridge). Jan. 14th, 1916.
2278 Flight Sub-Lieut. Melville Grant Dover, R.N.A.S. (Caudron Biplane, Royal Naval Air Station, Redcar). Jan. 14th, 1916.

2279 Flight Sub-Lieut. George Beverley Taylor, R.N.A.S. (Maurice Farman Biplane, Central Flying School, Upavon). Jan. 14th, 1916.

2280 Cecil William Blain (Maurice Farman Biplane, Military School, Ruislip). Jan. 14th, 1916.

The following Aviators' Certificates were granted:—

- 2281 Lieut. Alfred Henry Templeman Loraine Speer, R.F.A. (Maurice Farman Biplane, Military School, Norwich). Jan. 10th, 1916.
2282 Flight Sub-Lieut. Thomas Henry Newton, R.N.A.S. (Graham-White Biplane, Grahame-White School, Hendon). Jan. 16th, 1916.
2283 Philip Stanley Butterworth (Hall Biplane, Hall School, Hendon). Jan. 16th, 1916.
2284 Arsène De Launoit (Belgian Subject) (Caudron Biplane, Ruffy-Baumann School, Hendon). Jan. 16th, 1916.
2285 Gilbert Harold Earle Rippon (Maurice Farman Biplane, Military School, Brooklands). Jan. 16th, 1916.
2286 Gilbert Sudbury Hall (Maurice Farman Biplane, Military School, Ruislip). Jan. 16th, 1916.
2287 Charles Arthur Robert Shum (Hall Biplane, Hall School, Hendon). Jan. 16th, 1916.
2288 Stanley Walter Mann (Hall Biplane, Hall School, Hendon). Jan. 16th, 1916.
2289 Flight Sub-Lieut. Rupert Edward Darnton, R.N.A.S. (Caudron Biplane, Royal Naval Air Station, Redcar). Jan. 16th, 1916.
2290 Mathieu van Roggen (Belgian Subject) (L. and P. Biplane, London and Provincial School, Hendon). Jan. 16th, 1916.
2291 William Feild, Langstaff Castle (Maurice Farman Biplane, Military School, Brooklands). Jan. 16th, 1916.

AMERICAN CERTIFICATES.

- 368 W. Roy Walker (Curtiss type Biplane, Christofferson School, Alameda, Cal.). Nov. 7th, 1915.
371 Joseph Gorman (Wright Biplane, Stinson School, San Antonio, Texas). Dec. 3rd, 1915.
372 Herbert MacKenzie (Wright Biplane, Stinson School, San Antonio, Texas). Dec. 6th, 1915.
376 John A. Harman (Wright Biplane, Stinson School, San Antonio, Texas). Dec. 9th, 1915.
377 Marcel C. Dubuc (Wright Biplane, Stinson School, San Antonio, Texas). Dec. 18th, 1915.
379 Alfred John Croft (Curtiss Biplane, Curtiss School, North Island, Cal.). Dec. 16th, 1915.
381 George Henry Witts (Curtiss Biplane, Curtiss School, North Island, Cal.). Dec. 18th, 1915.

Aeronauts' Certificates.—The granting of Aeronauts' Certificates Nos. 58 and 59 was confirmed.

The granting of the following Aeronauts' Certificates was confirmed:—

- 60 Flight Sub-Lieut. William Petrie Nicholls, R.N.A.S. Jan. 14th, 1916.
61 Flight Sub-Lieut. H. V. Terry, R.N.A.S. Jan. 14th, 1916.
The following Aeronaut's Certificate was granted:—
62 Flight Sub-Lieut. Stanley Bell, R.N.A.S. Jan. 18th, 1916.

THE FLYING SERVICES FUND

administered by

THE ROYAL AERO CLUB.

THE Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions.

	£	s.	d.
Total subscriptions received to Jan. 11th, 1916...	10,399	15	2
Collected at the Westland Aircraft Works, Yeovil (Fifteenth contribution) ...		0	12 9
Staff and Workers of Gwynnes, Ltd. (Seventh contribution) ...		10	17 3

Total, January 18th, 1916 ... 10,411 5 2
166, Piccadilly, W. B. STEVENSON, Assistant Secretary.

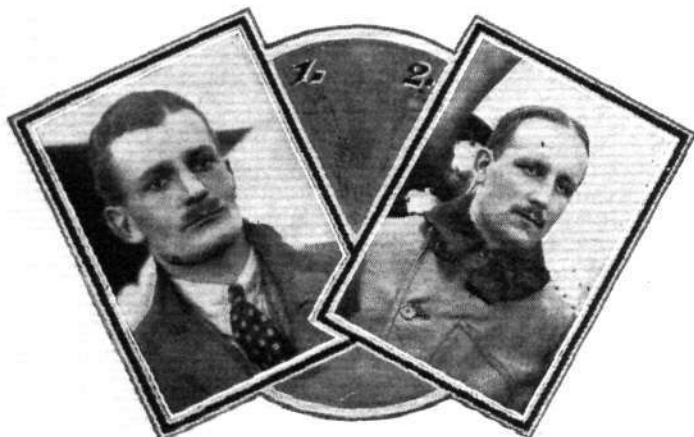


London Aerodrome, Collindale Avenue, Hendon.

Grahame-White Civilian School.—Straights with instructor last week: Messrs. Butler, Smith, Verguill, Eichbrenner, Barret, Hathaway, Hillaby, Williams, Leigh, Matthews, Parkinson, Sandys, and F. Williams. Circuits and eights with instructor: Messrs. Grasset and McClaughrie. Circuits and eights alone: Messrs. Henshaw and Hallet.

Brevet during week: Mr. Hughes.

Grahame-White School (R.N.A.S.).—Straights with instructor: Probationary Flight Sub-Lieuts. Coloquhon, Cook, Cuckney, Durston, Evans, Kingsford, Maxted, Rampling, Rees, Rockey, Templeton, and West. Eights with instructor: Probationary Flight Sub-Lieuts.



Copyright, F. N. Birkett, from the F.N.B. Series of Aviators.
Pilots who have recently obtained their certificates at the Ruffy-Baumann School: 1. Mr. W. J. Martin Tomson; 2. Mr. W. G. Stewart.

Burden and Jones. Eights alone: Probationary Flight Sub-Lieut. Newton.

Instructors during week: Messrs. Biard, Manton, Hale, Pashley, Russell, and Winter.

Beatty School.—The following pupils were out during last week: Messrs. Baker, Barnes, Barrow, Brand, Branford, Brynildsen, Cumming, d'Allesina, Drysdale, Dunne, Edwards, Fellowes, Greenhill, Hodgson, Jaquin, Jones, le Champion, Markham, Martin, Mossop, Owen, Podmore, Samter, Schollaert, Sellars, Stampe, Symington, Wainwright, Whincup, Williams, Willmet, Young and Parsons.

The instructors were: Messrs. G. W. Beatty, W. Roche-Kelly, G. Virgilio, R. W. Kenworthy, A. E.

A German Seaplane Adrift.

AT noon on January 12th, the German seaplane No. 510 was found, by a Dutch boat, drifting near the Noordhinder lightship. The two officers were taken on board the lightship, after abandoning their machine, and they were subsequently taken by the Dutch pilot boat Coertzen to Flushing and handed over to the military authorities. According to a message received from The Hague on Tuesday, the two officers have received permission to return to Germany.

Mitchell and L. L. King, the machines in use being Beatty-Wright dual-control and single-seater propeller biplanes and Caudron tractor biplanes.

Mr. O. C. Godfrey flew for his certificate on the 12th, making excellent flights throughout.

Hall School.—Excellent practice was put in last week by the pupils of the Hall School, and Royal Aero Club Certificates were taken by Capt. Grey (Indian Army), Messrs. Stirling (son of late Lord Mayor of Doncaster), Butterworth, Shum, Mann, whilst Wilkins made tests A and B. The majority of the other pupils are getting on well.

With Cecil M. Hill and H. Stevens: Messrs. Redford, Evans, Butterworth, Cook, Nicolle, Sepulchre, Shum, Mann, Dresser, Punnett. All doing circuits or half-circuits, figures of eight. With John Drew and Anstey Chave: Messrs. Baron Ackroyd, Arnsby, Chapman, Collins, Niel, Lieut. Cooke, Millburn, Rayne, Ridley, Robert, Rochford, E. Smith, Thom, Wooley, Ormerod, Camberbirch, S. Smith, Mahoney. All doing rolling practice and straight flights.

Machines in use: Hall and Caudron Government type tractors.

London and Provincial Aviation Co.—Pupils doing rolling last week: Messrs. Snow, Rimer, Aldous, Egelstaff, Verbessem, Vertongen, Loomes, Dawson, Darwin, Pulford, Stevens, and Starey. Doing straights: Messrs. Hardy, Heyn, and Van Roggen. Circuits: Messrs. W. E. Thorpe, B. H. Hunt, and Lieut. E. R. Manning.

Instructors: Messrs. W. T. Warren, M. G. Smiles, C. M. Jacques, H. Sykes, and W. T. Warren, jun.

Four good Royal Aero Club certificates were taken by Lieut. E. R. Manning, Messrs. W. E. Thorpe and B. H. Hunt, and Lieut. Van Roggen.

Ruffy-Baumann School.—One or two opportunities arose last week for school work, and the following pupils were enabled to put in their practice on the 50 and 60 h.p. machines. A great deal of work has again been accomplished inside the sheds, and erecting is progressing rapidly. With instructor: Muspratt, Thomsen, Durand, Edgar, Whitaker, Hoskyn, Cox, Yiule, Laidlaw, Cuthbertson and Flanders. Straights or circuits: Vernon, Griffith, de Launoit, Hamtiaux and Pauli.

Certificate taken: Monsieur Pauli, of the Aviation Militaire Belge. This ticket was taken in brilliant style, and finished with a clever *vol plané*.

Instructors: Edouard Baumann, Felix Ruffy, Ami Baumann and Clarence Winchester.

German Aeroplane Over Holland.

INFORMATION was received by the *Echo Belge* last week that on January 10th an Aviatik aeroplane was seen flying over Selzaete and Sas van Ghent. Dutch soldiers fired on it, but it is said to have escaped, owing to its altitude, going off in the direction of Terneuzen.

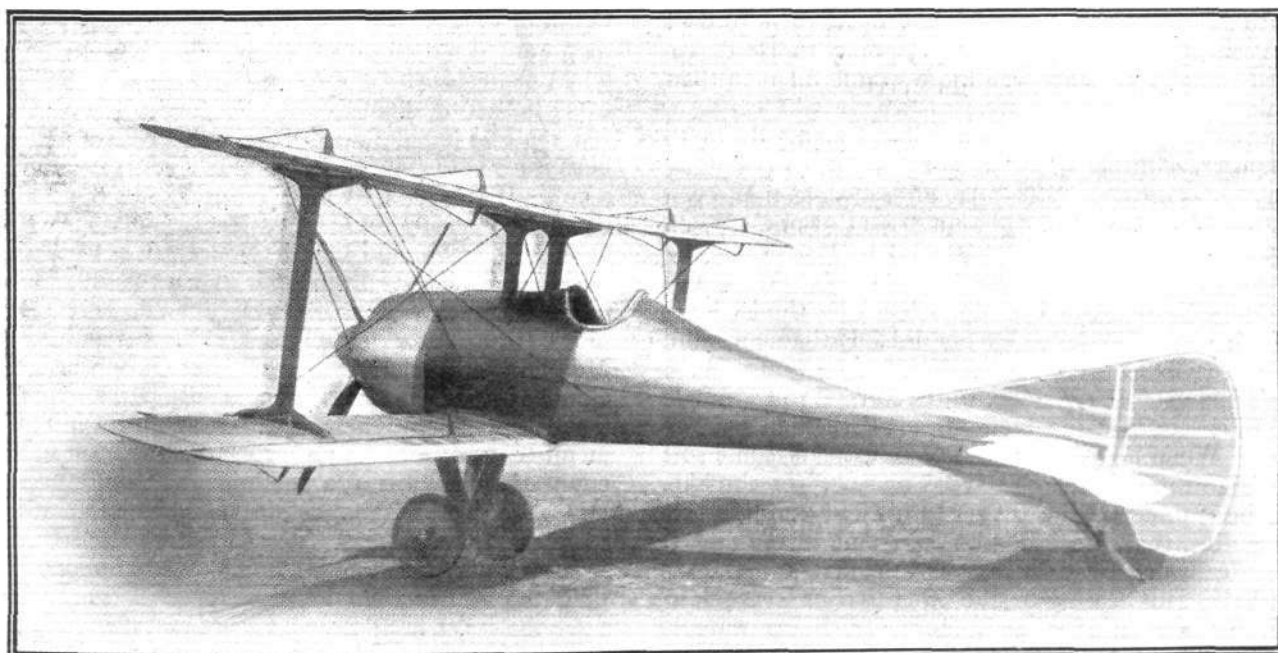
On the other hand the *Telegraaf* states that the machine was seen to be hit and capsized soon after it had crossed the frontier into Belgium.

"AIRCRAFT IN WARFARE."

The R.A.F. type S.E. 4 single-seat reconnaissance machine, one of the illustrations from Mr. F. W. Lanchester's new work, "Aircraft in Warfare."

SELECTING the above title, Mr. F. W. Lanchester, the eminent engineer and scientist, has had reprinted by Messrs. Constable and Co. a series of articles from his pen which originally appeared in *Engineering*. The author has added a couple of chapters so as to bring his views up to date, with no doubt the more recent happenings in aviation and lessons learnt from the war in his mind. The book is a highly valuable contribution to the science of aviation, and being couched in non-technical language almost throughout, is well within the understanding of the veriest tyro interested in aerodynamics. Not the least interesting addition to the previously printed chapters is an introductory preface by Major-General Sir David Henderson, K.C.B., the indefatigable and capable Director-General of Military Aeronautics. General Henderson is distinctly candid and caustic in his comments upon the self-appointed "aeronautical expert," who is so frequently bobbing up under various guises, and in the most

unexpected quarters. General Henderson, as a highly practical man, holds strong views of his responsibilities, and even records in the preface his difference of opinion with some of the author's contentions; which all makes for efficiency, and is, therefore, the more welcome at the present stage of development of air conquest. Mr. Lanchester in his two new chapters has a good deal to say about air raids and the value of numbers; the strategic employment of air power; unsolved questions of national defence; radius of action and power of aggression; inter-dependence of naval and air defence; aeronautical development being a national responsibility, and concludes by advocating that immediate measures should be taken. The book is published at 12s. 6d. net, and we shall hope to return to its subject shortly. Two pictures of R.A.F. machines which Mr. Lanchester, who is a member of the Advisory Committee for Aeronautics, gives prominence to are reproduced on this page.



The R.A.F. S.E. 4 single-seat reconnaissance machine, illustrated in Mr. F. W. Lanchester's new work, "Aircraft in Warfare." Three-quarter view from the back.



IF I had a vote to give on Tuesday I should give it to P.B. I should give it freely and ungrudgingly because it would help P.B. to be returned for Mile End, and so become P.B.—M.P.

I could almost wish I lived in Mile End so that I could go to the polling station on this day to put my cross against the name of Noel Pemberton-Billing, for it will be a great occasion, this polling for the first aviator candidate, and my voting should be in keeping with the marriage of aviation and Parliament, for it would be my maiden vote.

Never once, since I attained man's estate and became empowered to help to return my favourite to the dignity of Parliament have I exercised that privilege, first because I have never had a favourite, and secondly because I recognised the futility of it all even before I attained the power to vote, and I am speaking with the weight of years behind me. My personal knowledge goes back through many parliaments; back through those of Salisbury, of Gladstone, even to Beaconsfield, all of them strong men of their kind, who have left their mark upon the statute book of this country. I have witnessed many elections, general and otherwise, and I have seen men galore returned as members. I have listened to electioneering speeches by the hundred, and been interested.

Many of those candidates have meant well, and fully intended to do all the great things they said they would do, and many of them never intended to do anything of the sort, but it has all come to the same thing in the end. Parliament is a wonderful filter, and will strain the enthusiasm out of the most enthusiastic.

I know P.B. I know his inventive faculties. I know his tremendous energy. I know his foresight. I know he knows what is wanted, and I believe he thinks he is going to get things done, but he has never had to deal with Parliament before, and he is going to be disappointed—unless he is an even more wonderful man than I think.

I can see P.B.—if he is returned—slipping down to Westminster with his mind, if not his car, to get going at sixty miles an hour. The day after his election, even if not the same day, P.B. will want to get to work. When he made up his mind that he wanted to learn to fly, he got up and learned one morning before breakfast, and got done with it. And I firmly believe he thinks he is going to carry the same energy into Parliament, and produce results in the same manner, but he won't. P.B. doesn't understand red tape, and red tape will strangle him. His are not the methods of Parliamentary procedure. When he asks a question he expects some sort of a straightforward answer, "yes" or "no," or the like. When he is told that the answer to his first question is in the negative, that the second, arising out of the first, is automatically negated by reason of the first, and that the third, having no bearing on the other two, or on anything at all for that matter, and, moreover, being thought against public policy, in addition to the fact that the speaker has no knowledge of the fact, or if he has, is not

in a position to make a statement, and that the matter must be brought before a certain minister for certain things, who will see that the hon. member is provided with a form to fill in, which shall have due attention, and a statement made, if such statement can be made, when the facts can be obtained from various people having charge of various things—poor P.B. will drop his monocle and gasp!

If it were his business, and P.B. thought a gun ought to be placed on the top of a monument, he would expect to run down to Woolwich in his car and get one to bring back with him, and if the monument people had any scruples, he would buy the monument.

What P.B. doesn't know about Parliament is, that there is no need to hurry. There's plenty of time! No need to rush in and wake everybody up! The war isn't going to end this week. If P.B. wants to light up London, and build giant aeroplanes to fight off the Zeps., he is at perfect liberty to make a statement of his proposals at the proper time, and in the proper place, provided he can catch the Speaker's eye. And then it will be given due consideration, and he can come round some day when he is not busy and they can talk it over, over a cup of tea.

Many a good man has started before now to reform the Army, or the Navy, or Parliament, or something or other. Started with the idea that the Army or the Navy, or whatever it was, didn't know what they wanted. Started with the idea that he must be a God-inspired being, sent at the opportune moment to save his country. Started with the idea that a posthumous statue with ill-fitting trousers would be erected to his memory opposite the Abbey. Started only to find out that the others knew perfectly well that they wanted reforming. Knew perfectly well how to go about it. Knew perfectly well that all they wanted was to be left alone, and, knew perfectly well how to squeeze the enthusiasm out of any meddler who came bothering them.

I shall be pleased if P.B. is returned for Mile End, because it is his fancy, and I should like to see him have a cut. It may be that he is a greater and stronger man than even I, one of his greatest admirers as a strong man, may think, and that he really will get things done, but I doubt it—might as well try to eat jelly with a hat pin.

I cannot fancy myself that P.B. was cut out for a Member of Parliament. He has not that maudlin eloquence necessary to successful parliamentary verbosity. As a gentleman, I can hear him asking a fellow member to withdraw a rude remark, but I am quite sure, could he follow his own methods, he would rather take him outside on the terrace and plant one in some tender spot.

P.B. would be more at home, in my opinion, kidnapping the Kaiser than making speeches in Parliament; nevertheless, I hope he will get in, and if he does, I shall follow his progress with interest. But I quite expect to see him turn out—just a Member of Parliament.

THE AIR ELECTION.

THE campaign in connection with the bye-election at Mile End is now in full swing, and Mr. Noel Pemberton-Billing, who is standing as an Independent candidate, with the view, if successful, of fighting for a strong air service, has added considerably to the interest of his meetings by speaking from and touring the constituency with an aeroplane which he has built. Below we reproduce a few extracts from some of Mr. Billing's statements and arguments.

Writing in the *Daily Mail* of December 12th, Mr. Billing says: "It can surely be nothing less than humiliating to the citizens of this, the greatest and proudest city in the world, the centre of what has once more proved itself one of the finest fighting races on earth, to be told that for the safety of their homes and the lives of their families they must trust to the chances of the weather or to a darkness which is the cause of 'numberless accidents.'"

"It is not now necessary to speak of the possibility of air raids. That has been proved by a series of what have been merely experimental efforts in preparation for a raid or raids on a scale far greater than anything we have yet seen.

"That this is probable, or, if we do not make proper preparation to meet it, absolutely certain, has been told us by the German Government themselves, which has the intention of making a devastating air raid upon London, compared with which all the raids that have already been made will seem mere child's play. It will be nothing but the blindest folly to neglect such a warning.

"Contrary to the general public belief, it is not Zeppelins alone which this country will have to meet. What a Zeppelin or two can do we already know. What will a fleet of them effect? And what will a fleet of more dangerous craft than the Zeppelin do?"

"It must be remembered that before the war German aeroplanes, not Zeppelins, but the speedier and more manageable heavier-than-air machines had flown for periods from between 15 and 24 hours without alighting. It is known now that Germany is completing enormous quantities of bomb-dropping aeroplanes, capable of carrying big loads of death-dealing missiles for enormous distances. *These aeroplanes are obviously intended to be used against England, and probably London.*

"Is London prepared to meet them?"

"The question is, since the war men have been trained, machines have been devised, proved, and built, but the proper use of men and machines has been neglected. The organisation and direction of this important branch of defence seems to make little appeal to the politician. Yet on it depends the protection of the homes and families of this crowded city."

In a letter to the *Daily Mail* of the 15th, Mr. Billing gives the following reasons for his candidature:—

"I believe that it is a vital necessity to the safety of the country that the Air Service should be rescued from political novices and amateurs who have hampered and bungled it.

"With party politics at the moment I have not much concern, but party politicians are suggesting that the gentleman who is opposing me is as keen as I am upon the efficiency of our air defences, and that I should be muzzled by the Censorship as one who may be presumed to have acquired in the public service knowledge which ought not to be revealed.

"This is a typical example of the manner in which everyone who has attempted to get something done during the war has been treated by a certain class of politician. His motives and his patriotism are attacked, and the cry goes up from the Hiders of the Truth of 'Muzzle him.'

"My opponent may, indeed, be as anxious as myself and every other Englishman, to prevent Zeppelins from raiding our capital, but has he done anything to prevent it? Has he the technical and practical knowledge of aeronautics to enable him to do anything or to help to do anything? Does he, any more than apparently the present members of the Government and House of Commons, know what can be done, and how it can be done? This can only be known by men who have the necessary knowledge and experience. These men are few, and practically all of them are in the service, and are thus prevented from calling public attention not to things 'that in the interest of the country ought not to be revealed' but to things that every thinking man in the country ought to know.

"I have, accordingly, resigned from the Royal Naval Air Service to help, to the best of my ability, in the work of winning this war. I am offering not 'knowledge acquired in the public service that in the interest of the country ought not to be revealed' but knowledge acquired by practical experience from the earliest days of modern aerial science continued up to the present moment. I have devoted the last twelve years of my life to this science, and am confident that if every use possible were made of the resources which the modern airman has at his hand, the danger of air raids upon England will vanish like the phantom of a dream, and the Zeppelin bogey will be laid for ever."

Writing in the *Referee* of last Sunday Mr. Billing says:—

"With the strong policy which I am advocating, and which I have worked out to the minutest detail, London could be made

safe from attack in a few weeks. We should have an air fleet forming as sure a shield against the entrance of the enemy to this 'island'—which for the time being has ceased to be an island—as is the Navy in its own element.

"How long is London to suffer the inconvenience, the danger—a far greater danger than is embodied in the Zeppelin menace—of the lighting restrictions, which are bringing residents of the metropolis into a nervous state that is showing itself in all forms of irritability?"

"Are we to deal with the Zeppelin question as a fighting proposition?"

"A strong, highly organised, highly efficient aerial force will mean that London traffic and London life will return to the normal. So much in earnest am I on this matter that, if need be, I will fight seat after seat until I have induced the country, through Parliament, to concentrate on this vital point.

"Although I am making the Air Service the principal plank of my platform there are other questions upon which I hold strong views."

In a speech at the Mile End Palladium on Sunday afternoon Mr. Billing said:—

"In Parliament he would be able to enforce such a vigorous air policy that the German aircraft would be attacked where they were built and where they were harboured, would be fought in the air before they reached our shores, and would find the sky over London so well guarded that, when they came, such as escaped would go away and never dare to return.

"This could be achieved if our airmen were given a chance. They were not given a chance because the Government and the politicians had not yet realised the power and effect of the aeroplane in warfare and the necessity of an efficient organisation of the Air Service.

"The British airship which flew over London a few days ago would not be much good against a Zeppelin; but we have a machine—it has flown for the first time this morning—which carried an armament before which a Zeppelin would turn back and never come here again."

Mr. Bottomley, referring to this statement, said Mr. Billing was too modest. Mr. Billing was not only the inventor, but the builder of the machine in question, and the day he was returned to Parliament he would fly on it over Mile End and drop his vote of thanks to the electors from the skies.

Dealing with a definite constructive scheme, Mr. Pemberton-Billing has outlined his skeleton plan as follows:—

"If I were elected I would demand an air defence committee of five members of the R.N.A.S., five of the R.F.C., three politicians, and two civilians. This committee would sit for ten days. It would not rise on Mondays and adjourn till Thursdays. It would meet at 10 a.m. and sit till midnight if necessary. In ten days that committee would know all the facts about the air defences of this country. Then I would make it absolutely responsible for the defences. *For I should take good care that every member was an expert.* It would have a free hand. I should say that it ought to build hundreds of patrol machines, which could fly slowly. They would make the ring of aerial sentries.

"I should standardise the patrol machines, the bomb droppers, the bombs, and everything in the service (as you standardise men and drill in a battalion), so that you could reduplicate everything from start to finish.

"I should defend London by sending swarms of aeroplanes to seek out every Zeppelin, every enemy aeroplane, and every enemy aircraft factory, to smash them and keep them so busy by persistent day-by-day attacks that to come to London would be the last thing they could think about.

"We should be able to fit out 10,000 aeroplanes, with pilots, quarters, and all complete, in a year. I would undertake to do the task as a business job in ordinary times. If it could be done as a commercial transaction, how much more could we not do in these days when the nation is feeling the inspiration of the Imperial idea?"

Mr. Warwick Brookes, the official candidate, has not been slow to recognise the popularity of aviation as an election cry, and at a meeting on Saturday he declared:—

"I am in favour of the air defences being placed in charge of a separate department, controlled by an Air Minister, who should have ample funds at his disposal and the benefit of the best expert advice and assistance that the country can command."

Interviewed by the *Daily Telegraph*, Mr. Brookes said there was one message which he particularly desired to give to the electors of Mile End. He wanted them to keep a calm and steadfast courage—not be influenced by exaggerated statements with regard to our protection from air raids, but to trust Sir Percy Scott, the greatest gunnery expert in the whole world, who had our air defence in his hands, and who had the confidence of the Government.

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British.

Delhi, Jan. 11th.

"General Aylmer's force carried the Turkish position at Sheikh Saad at mid-day on January 9th, and has now concentrated there. The Turks are retiring northwards along the Tigris. The weather is cold and wet. Aeroplane reconnaissance is hampered by the storms."

British Headquarters, Jan. 13th.

"Four of our aeroplanes sent out yesterday have not returned."

French.

Paris, Jan. 11th. Afternoon.

"In the course of yesterday afternoon three of our armoured aeroplanes were engaged in a series of air combats with enemy-pursuing aeroplane of the Fokker type, above the German line, in the neighbourhood of Dixmude. One of our machines, attacked by a Fokker, was forced to come to ground. But the enemy machine, being in turn attacked from our side, and being fired upon at a close range of 25 metres with machine-gun shells, was also brought down. The third French aeroplane also attacked another of the enemy's Fokker aeroplanes, which fell into the forest of Houthulst, south-east of Dixmude."

Paris, Jan. 12th. Evening.

"Two enemy aeroplanes dropped eight shells on Dunkirk, causing only insignificant material damage."

Paris, Jan. 15th. Evening.

"Army of the East.—On Friday enemy aircraft dropped bombs on Janes (north-west of Kukus) and on Dogandci (on the lower Vardar, North-west of Salonica). Some Greek soldiers were wounded and one was killed."

Paris, Jan. 17th. Evening.

"Two enemy aeroplanes which were flying towards Dunkirk were bombarded by our special guns, and were compelled to turn back. They dropped four bombs on the dunes without result."

Russian.

Petrograd, Jan. 17th.

"German aeroplanes carried out raids over Schlok, Kurienhof, and Dvinsk."

Italian.

Rome, Jan. 12th.

"On both sides there is great aerial activity. One of our air squadrons in a strong wind bombarded the enemy's aviation field at Gandolo to the north of Trent. On the way back it dropped bombs on the railway stations at Trent and Rovereto and the barracks near Volono. Enemy aviators threw bombs on several places in the Isonzo plain without doing any damage."

Rome, Jan. 13th.

"Along the whole front artillery activity continues, assisted and supplemented by aeroplane action. On Tuesday one of our aviators dropped bombs on the enemy barracks between Tione and Brogezzo in the Giudicaria valley, returning to our lines uninjured."

German.

Berlin, Jan. 11th.

"A French aeroplane, equipped with a 3·8 centimetre gun, was forced to make a landing at Woumen (south of Dixmude) by our anti-aircraft guns and one of our battle aeroplanes. The aeroplane, with its occupants, fell into our hands undamaged. At Tournai an English biplane was shot down after an aerial engagement."

Berlin, Jan. 13th.

"Lieutenants Boelke and Immelmann each shot down an English aeroplane to the north-east of Tourcoing and near Bapaume. In recognition of their exceptional services, His Majesty the Kaiser bestowed upon the two intrepid officers the Order Pour le Mérite."

"A third English aeroplane was brought down in aerial battle near Roubaix, and a fourth by the fire of our anti-aircraft guns near Ligny (to the south-west of Lille). Of the eight English flight officers six are dead and two injured."

Berlin, Jan. 15th.

"A hostile aeroplane which Lieutenant Boelke shot down north-east of Albert fell in the British lines and was set on fire by our artillery."

Austrian.

Vienna, Jan. 12th.

"In the district of Gorizia our aviators bombarded Italian camps."

Turkish.

Constantinople, Jan. 14th.

"On Wednesday one cruiser, nine torpedo boats, and one monitor opened an intermittent fire from outside the Straits on Cape Tekke, Seddul Bahr, and in the direction of Kilid Bahr (at the Narrows). The monitor was attacked by one of our aviators, and was obliged to withdraw enveloped in flames."

"In the afternoon the aviator Boddicke shot down a fifth aeroplane near Seddul Bahr. The pilot was killed and the observer wounded. Another Turkish aviator attacked an English aeroplane flying over Saros. The English machine was forced to descend on Imbros."

Constantinople, Jan. 17th.

"Our seaplanes dropped bombs on enemy ships at Mudros."



AIRCRAFT AND THE WAR.

THE *Echo Belge* on January 10th published the following:—

"A railway train has been hit by a bomb dropped by an Allied airman near the village of Orwyck, at the junction of the Brussels-Termonde and Antwerp-Alost lines. The damage done was considerable."

The Salonica correspondent of the *Tribuna*, in a message on January 8th, said:—

"Every day towards noon enemy aeroplanes arrive and drop bombs on the encampments of the Allies, but up to the present there have been no victims."

"These raids have cost much to the enemy, who has lost six aeroplanes, two of which were burned, two destroyed, and two captured."

"Yesterday there was a thrilling aerial battle between French and hostile aeroplanes. After two hours' fighting, shrapnel set fire to an enemy aeroplane, and the other hostile aeroplanes fled."

The following account of an air combat has been circulated as a supplement to the — Corps summary, and appears in the *Times* of the 6th inst.:—

"A recent fight, in which two airplanes from the squadron with our corps were engaged against heavy odds, deserves description in some detail. One of our machines, to which another was acting as escort, was engaged in reconnaissance work over Cambrai on the morning of December 29th. They were attacked by six German Fokker machines, firing through the propeller. The Fokker is a monoplane, expressly built and contrived for fighting and for pursuit of the enemy, to which duties its activities are by strict order con-

finer, and for which it is specially adapted on account of its high speed. It is not allowed to expose itself by venturing across our lines on reconnaissance work.

"In contrast to the arrangements of our airplanes, the machine-gun on the Fokker is immovably fixed in front of the pilot, with barrel straight to the front—the correct aim of the gun being ensured by manipulation of the whole machine, just as the correct aim of a torpedo from a submarine is contrived only by manipulation of the boat itself. The Fokker's machine-gun, being fixed, and fixed on the same plane as the body of the machine, fires through the propeller. Such bullets as miss the propeller naturally carry straight to the front; while such as are intercepted by its blades are dispelled by angled and bullet-proof 'deviators' attached to the back face of these blades. The Fokker, when in action, seeks by the exercise of its superior speed and climbing powers to attain a position above its adversary, and then, by diving at a steep angle, to bring the machine-gun to bear upon him by correct alignment.

"As a result of the machine-gun fire of the six Fokkers our escorting machine was immediately shot down, but its occupants seemed to reach the ground safely, so landing as to effect intentionally the destruction of their machine without injury to themselves. It was followed to the ground by two of the Fokkers. Our remaining machine succeeded in driving off and apparently in seriously injuring by its fire the first Fokker which had attacked it. It was out of control when last seen, and was nose-diving with every prospect of injury or death to its occupants.

"Our machine was then attacked by the three other Fokkers, which it fought for 15 minutes, and then, its machine-guns being temporarily out of action, its pilot decided that escape could only be sought by a very risky dive to within 20 ft. of the ground—risky in that it necessitated a descent by very steep spirals at a speed of quite 100 miles an hour, with little room to recover. Only very delicate and confident handling could ensure the success of this manoeuvre, which only the absence of other means of escape could justify. It was prompted by two other considerations. In the first place, a Fokker, being less handy, would not dare to pursue within 20 ft. of the ground, the margin for recovery after the nose-diving being so very restricted; and, secondly, if our machine was once more to reach friendly territory in safety, it was desirable that it should conceal from armed enemies to be surmounted in its front its nationality as displayed by the rings painted on the lower surface of its planes, and this it could only do by skimming over the ground at as low an elevation as possible.

"Skimming along just above the ground, as skims a grouse under a hawk, our machine, hard pressed, turned westward for home, whereupon one of the German machines, all of which had maintained an elevation of 1,000 ft., swooped towards it, but was promptly driven off by rapid fire, one gun by that time having been repaired.

"The fight continued half-way to the British lines, when two Fokkers gave it up. The British pilot and observer at once started climbing to attack the single remaining Fokker, but this brought back the two companions, and our machine resumed its original elevation. The three German machines ultimately turned back, giving up the chase when about a mile from the German lines, before crossing which the British pilot naturally sought to climb; but, our aeroplane being unable to rise higher than 800 ft. owing to the engine having been hit in the fight, pilot and observer were subjected to very heavy rifle, machine gun, and field artillery fire, which the machine fortunately survived, although its planes and spars were damaged, and more than one of its staves nearly severed.

"The anxieties of the position had for long been greatly increased by the knowledge that only sufficient petrol remained in the tank to bring the machine just within the friendly lines if a direct course was pursued, so that to be driven in any degree out of that course would have been fatal. Early in the engagement the oil feed had been shot away, and, with an engine injured by rifle fire, the chances of ever reaching home had seemed remote, but an expiring effort landed the machine just within the French lines south-west of Arras. Pilot and observer alike can congratulate themselves on a fine performance."

The *Daily Mail* correspondent at Salonica, writing under date January 11th, says:—

"German aeroplanes fly every day over the camp at Zeitenlik and drop bombs. To-day there were eleven wounded."

The Ghent correspondent of Van Dias agency, in a message on January 13th dealing with reports and rumours as to great supplies of ammunition and supplies being sent by the Germans from Ghent to the front in Northern France, says:—

"The Allies are well informed of all these movements, and their

artillery is seriously impeding the Germans' military programme. The French and British aviators in particular are doing splendid work."

An Exchange message from Athens, dated January 13th, says:—

"A squadron of French aviators bombarded the Bulgarian first-line trenches on Tuesday in the Strumnitza region. According to observations the bombs wrecked several trenches and killed and wounded a number of soldiers. The French air service is perfectly organised."

The *Daily Mail* correspondent at Salonica, writing on January 13th, says:—

"Thirty-five French aeroplanes yesterday bombarded several points of the enemy's camps, and started fires, and destroyed huts. There were numerous victims."

The *Daily Mail* correspondent in Paris, writing under date January 14th, says:—

"Few stories of the prowess of French airmen compel more sincere admiration than the last flight of Captain Sallier and Lieutenant Legall, who met their deaths during the recent fighting in Champagne. They were on a reconnoitring expedition, Legall acting as observer.

"While their biplane was over the German lines they were surprised by a Fokker (one of the new mono-battleplanes), which darted out of a cloud and began firing at them with a machine gun. An explosive bullet struck the Frenchman's petrol tank, and the aeroplane was immediately enveloped in flames. Its occupants realised that certain death awaited them, but with supreme courage they divided between them the maps and important documents in their possession, and tore them in small pieces as the blazing aeroplane fell to earth.

"Some scorched fragments were blown by the wind into the French lines, and in this way their brother-officers learned of the heroic conduct of their comrades.

"Next day a German airman flew over the French trenches and dropped a letter containing a tribute to the gallant Frenchmen, stating that they had been buried with military honours and that their grave had been decorated in the same way as the graves of German officers."

Reuter's correspondent at the British Headquarters in Macedonia says:—

"Aviators report an important concentration at Dorian, Ghevgeli, Kuprulu, and Uskub, while quantities of munitions and stores are being accumulated near the frontier.

"Meanwhile all is quiet on the frontier with the exception of air duels and raids, which are of daily occurrence."

Reuter's correspondent at Salonica on Sunday reports:—

"British guns brought down a German aeroplane which was flying over the Allies' lines this afternoon. The machine fell within the occupied zone. It caught fire in falling and was destroyed. Both airmen were killed."

In the "Wireless" news sent out from Berlin on Monday there appears the following:—

"Sofia: It is reported from Kambana that German aeroplanes bombarded the railway station at Kilindir, which had been occupied by the French. A petrol depot was destroyed by fire, and two French aeroplanes were destroyed in aerial battle. The German aeroplanes returned undamaged."

Mr. James Dunn, writing to the *Daily Mail* from Rotterdam on Monday, says:—

"At Oostburg, on the Dutch frontier, the guns were heard all day. Twelve Allied aeroplanes were reconnoitring between Cadzand and Zeebrugge, despite a heavy bombardment by anti-aircraft guns laid in pits in the dunes."

✱ ✱ ✱ ✱

Zeppelins and Mine-Laying.

In a message from Copenhagen on January 12th the *Daily Mail* correspondent says:—

"Three large Zeppelins of the latest type left Schleswig yesterday and went in a north-easterly direction. They were observed from several coast towns and by steamers to be exchanging flashlight signals with German warships in the Belt.

"At the same time a big flotilla of German mine-layers was observed, evidently guided by the Zeppelins."

HOW TRIPLEX SAFETY GLASS IS MADE.

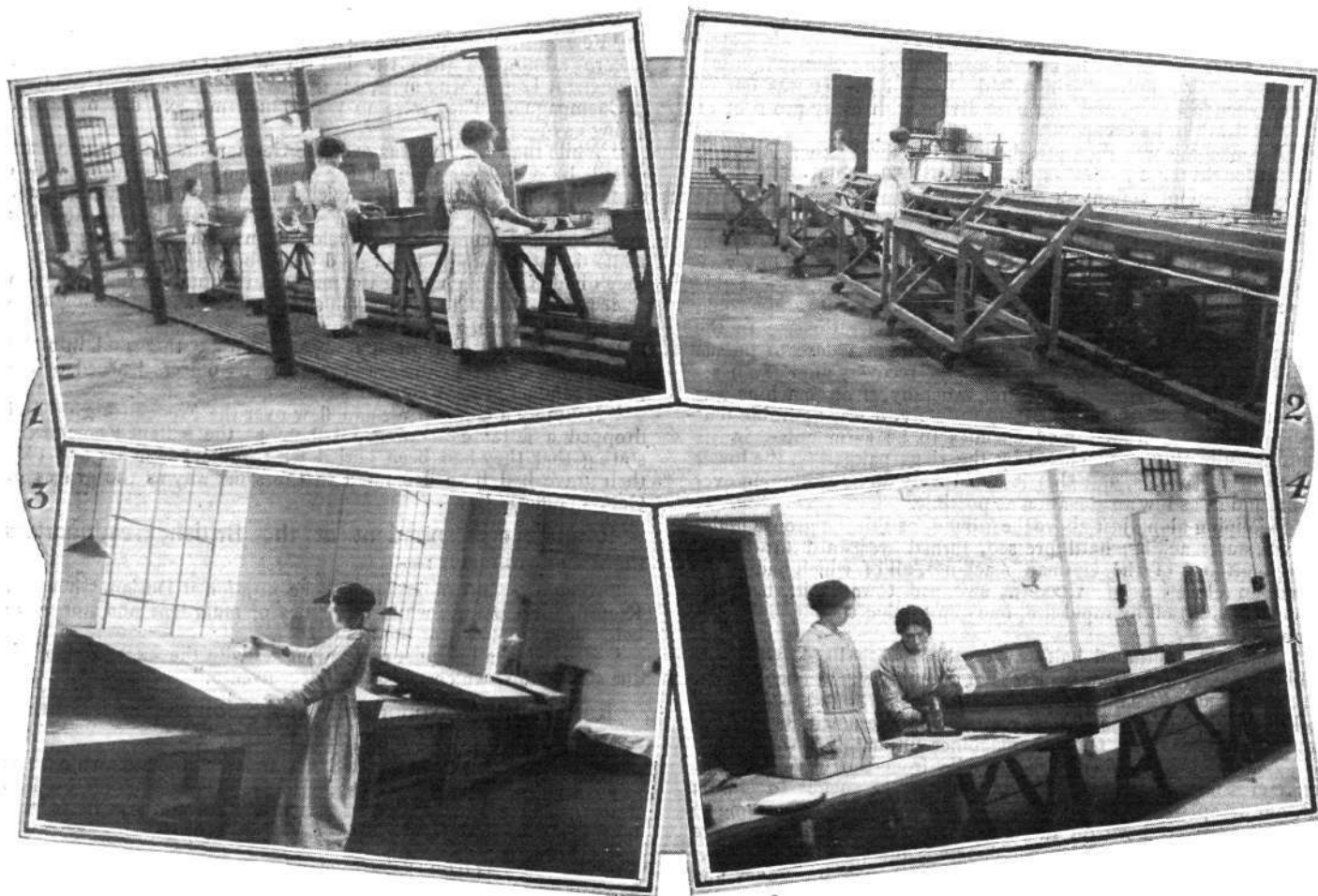
ASK the first of your aviator or motoring friends, What is Triplex glass? and he will tell you that it is just simply two pieces of glass stuck together, with a piece of xylonite in between. And he is perfectly right; but from the light way in which he tells you of it, he can have no conception of the skill and care necessary to sandwich that piece of xylonite between the glasses in just such a way that it shall, in addition to rendering the glass safe, answer all the requirements of the ordinary windscreen, or other purpose to which it is put, with none of the disadvantages attaching to ordinary glass.

Before accepting the invitation to visit the Triplex works at Willesden to receive ocular demonstration of the reason that Triplex cannot be supplied at the price of ordinary glass, I had some idea of the difficulties likely to beset the manufacturers by reason of an intimate knowledge of gelatinising large surfaces, and an even more intimate acquaintance with the collodionising of large sheets of glass in the old collodion-transfer days of photography,

sometimes, even when looking through the glass at right angles. The quality of the glass used in the manufacture of Plate Triplex is such, and so perfect is the optical contact obtained, that even when viewed through a screen set at an angle of 45 degrees, no difference from normal vision will be noticed.

Therefore one of the first reasons why Triplex is not cheap is on account of the quality of the glass used. In addition, the manufacturers must use thin glass, and not only that, but glass that is not of standard thickness, which will be obvious with a little thought. Suppose it is needful to make a motor windscreen which shall be of one quarter inch thickness. There is plate polished to one-eighth, and two would make one quarter, but there is the thickness of the xylonite to be allowed for, which means that the plate must be specially prepared "bare" by this amount, and, as can be easily supposed, this means money.

Before taking my readers on a round of the works, let me digress to say that practically the whole of the operations in the manufacture



THE MANUFACTURE OF TRIPLEX SAFETY GLASS.—1. Polishing and washing the glasses. 2. Coating the glasses with adhesive, by machinery. 3. Enamelling. 4. Making a test preparatory to pressing.

both of which I guessed, and rightly, would come into the category of operations necessary to the welding of these three objects together.

In paralleling these processes it is necessary to point out that the workers in each are aiming at opposite ends. For where in photography one aims at getting a mixture which shall strip from the glass with the utmost ease attainable, the workers in Triplex aim at getting the greatest adhesion possible, and this they have attained to the extent that if a piece of Triplex were cemented on both sides to a machine able to impart immense tension, and so pull the glasses apart, the xylonite, rather than leave the surface to which it has been affixed, will pull away the surface of the glass.

One knows that when a number of pieces of glass or other material are formed into a block through which it is desired to see, each of the several surfaces reflect the light rays unless they are in actual optical contact. Common glass will distort to such an alarming degree, that when viewing a street through a window glazed with it, it is no unusual thing to see a man's head suddenly leave his body and come sailing along a yard above him, and this,

of Triplex are performed by girls, it being found that they are most capable in handling the glasses as they pass through the successive stages. It was found necessary at the beginning to send a number of girls over to the Triplex works in France to become sufficiently expert in their work.

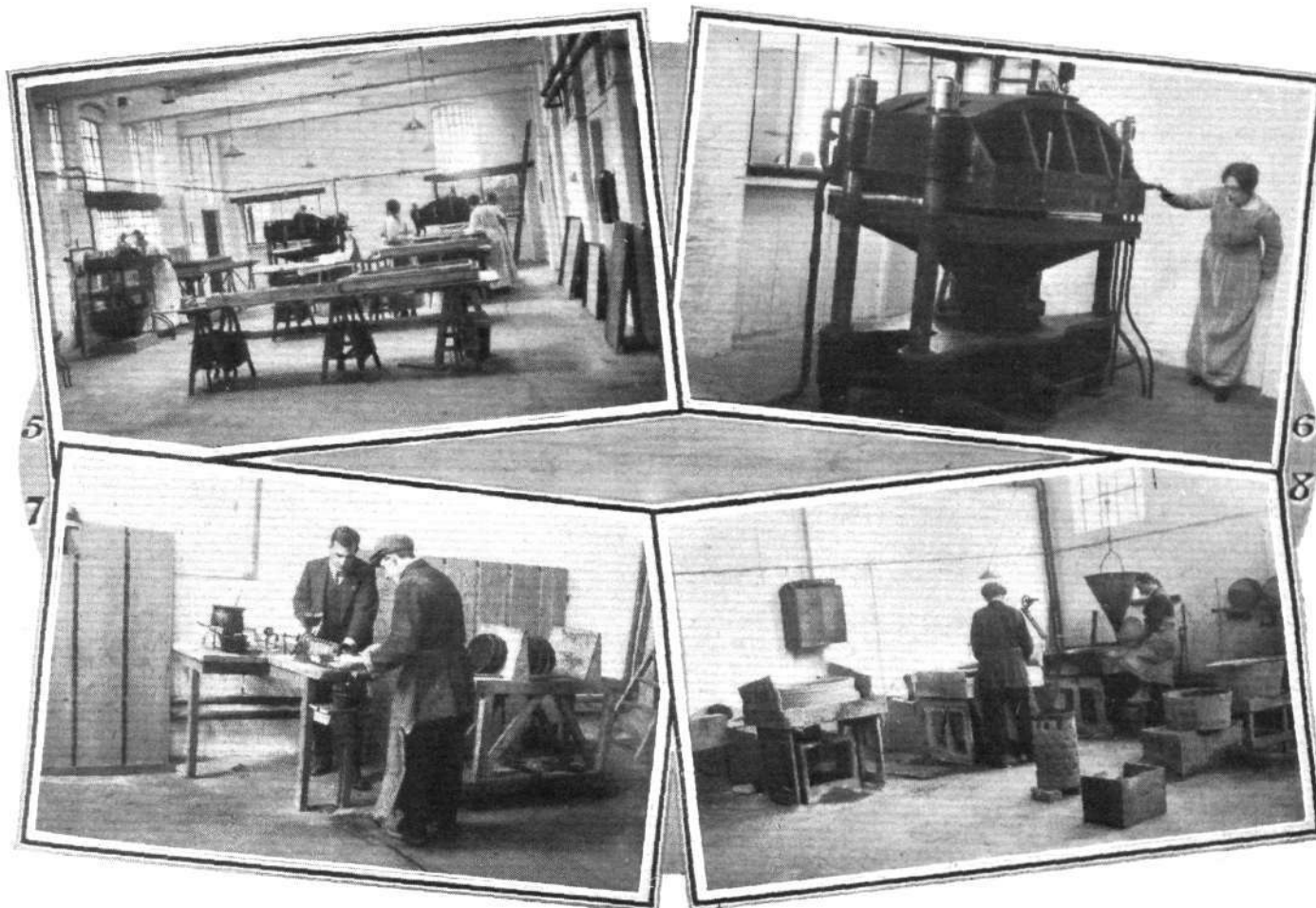
But to the actual manufacture.

Let us suppose that we have placed an order for a windscreen for a car, and the proprietors have graciously allowed us to witness its manufacture. Our screen is to be 48 ins. long by 20 ins. wide, with rounded top corners, and it must be exactly $\frac{1}{4}$ in. thick to fit our frame. Two pieces of glass are selected, of a size of about 1 in. each way larger than the finished dimensions, to allow for trimming. The glass must be that known as silvering plate, or, at least, the very best quality of glazing plate. The plates are taken to a cleaning bench, where they are treated to a rubbing of special preparation, of which rouge forms one of the constituents, in order to remove every particle of foreign matter. They are now well washed in pure water, and set up to dry away from any possibility of dust settling on the surface; nor must they from now onward be touched by the

hand until the second adhesive coating is dry, being handled only with dusters.

When dry, they are placed in the coating machine to receive their covering of adhesive mixture. This machine is of great length, and the plates travel along under a dust-proof casing, and in the summer through ice chambers, so that when emerging at the far end, the coating mixture is sufficiently set to allow the plates to be racked up in cupboards, through which dry, warm, filtered air is circulating, and so finally dried. They are now ready for the enamellers, a process of which I am not allowed to say much, excepting that it consists of coating the prepared glasses with a transparent enamel, which is in its turn dried. From here we follow our screen that is

It is fascinating to watch these presses coming slowly down with their gigantic force, knowing that that which they are about to press is but glass. Let but a speck of grit be on the plate, a tiny morsel of xylonite be stuck to the glass, or even a pimple of infinitesimal size have escaped notice in the glass, and our windscreen will be cracked and powdered into dust at this spot, and all the material and time wasted. The screen is now examined for any flaw, and should one appear the whole thing becomes scrap, for it must not be supposed that a faulty screen of Triplex can be cut down to smaller sizes with impunity. Once the three or more pieces are cemented together, cutting is extremely difficult, and can hardly be considered a commercial success. From the press room the article goes to the



THE MANUFACTURE OF TRIPLEX SAFETY GLASS.—5. One end of the press room. 6. One of the hydraulic presses descending. 7. Sealing the edges. 8. The bevellers at work.

to be to the cutter, who will cut off the few inches from the edges and round the corners.

The next operation is to remove the coating of enamel for a small distance from the edge, all round, leaving only just that amount which shall coincide with the exact size of the sheet of xylonite to be used, which in itself will not come quite to the edge, owing to the necessity of leaving room for the sealing matter.

The sheet of xylonite having been selected and trimmed to exact size, the whole is taken to the press room, where the xylonite is treated and accurately placed between the two glasses. It is now to be pressed into optical contact. This is accomplished by hydraulic pressure and heat, the presses exerting a pressure of from 100 lbs. to 200 lbs. per square inch, maintaining this for a definite period.

The Benoist Boat in Great Britain.

AFTER the recent successes of the Benoist flying boats in America it is not surprising to hear that this firm has started to look round for a better market in Europe than that existing across the "pond." It is all the more credit to Mr. Benoist that he has persevered and succeeded, in spite of scanty encouragement from his own country, until his products are among the best of their kind. While on a business trip to this country recently Mr. Benoist made arrangements with Messrs. R. F. Wells and Co., of Chelsea, who

sealer, who deftly fills in the margin not occupied by the xylonite with a black composition. The Triplex is now hermetically sealed against air and weather, which is necessary to keep the adhesives immune against time. To the beveller, then, who will skilfully bevel the edges and finish off the corners, and our screen is ready.

It is true, therefore, that Triplex is just two bits of glass stuck together, with something in between, but that sticking together entails more skill and careful handling, and opens so many more avenues of failure in individual work, than the average purchaser knows of, that it is quite feasible he wonders why it is not cheaper.

It is to be hoped these few words will now enlighten him as to what it is he is really buying, which, as Mr. Reginald Delpuch, the managing director of the Triplex Company, says, "is not only a windscreen, or a pair of goggles, but an insurance policy."

will be sole agents for the Benoist machines and who have acquired sole building rights. As this firm have been doing quite a lot of aeroplane construction work they should be in a position to tackle a job like the building of a big Benoist twin-engine flying boat with confidence, and one hopes that these famous machines may soon become more familiar to us by practical demonstrations than they already are through illustrations and descriptions. With regard to the latter, by the way, we hope to be able to publish some interesting details shortly.

COMPANY MATTERS.

The Blériot Manufacturing Aircraft Co., Ltd.

AN Extraordinary General Meeting of this Company was held at the Hotel Metropole on January 13th. Earlier in the day a meeting of shareholders, convened by the Shareholders' Committee, was held at the Hotel Cecil, Lord Ebury being in the chair, and Mr. William A. Casson making a long statement regarding the promotion of the Company.

At the afternoon meeting, at which the Duke of Manchester, chairman of the Company, presided, three resolutions were brought forward:—

(1) Authorising the directors to manufacture and sell aeroplanes, other than Blériot aeroplanes, and if thought fit, to complete the purchase of the Blériot business or to vary the terms of the agreement with the vendors and M. Blériot, &c.

(2) Authorising the Board to take steps to defeat the petition for winding up the company, and to carry on the business.

(3) Removing Mr. W. A. Casson (or any other director) from his position as a director and appointing a person to be nominated by the meeting in his place.

In the course of an address the Chairman said that the third resolution arose from his suggestion that every member of the board should submit himself for election by the members holding £1 shares. All the members were prepared to submit themselves to the shareholders. He had come to the meeting on that understanding. He still felt that on the lines laid down in the prospectus the company should be a great success, with the management entirely in the hands of the shareholders—greater even than was foreshadowed in the prospectus. A few days before the date when the contract with M. Blériot was to be completed, he saw that gentleman, who then was apparently entirely satisfied.

A few weeks later they were told that M. Blériot was not going to complete at all, on the ground that he had not understood a deed he had signed, and that he did not approve of the presence on the Board of Mr. Lawson, and, further, that he felt himself entitled not only to one-fourth of the profits but to one-fourth of the voting powers.

There ensued a considerable amount of interruption, and the chairman, unable to continue his speech, formally moved the first resolution. Mr. Harry J. Lawson, who seconded the motion, said that the shareholders' only chance of getting their money back in full was through him. They had got the works; they had got machinery in full operation; and they would be taken over the moment these little technicalities were got over. The proposition he was willing to make was that cash shareholders should elect representatives to sit on the Board, where they would be able to see every document and to know everything that was going on.

After some further discussion the chairman put the first resolution to the meeting. No hand was held up in its favour, and many against it, and the chairman demanded a poll, adding that the votes of cash shareholders would be taken to decide the question.

In reply to Mr. Casson, the Chairman said that 515 members had withdrawn proxies they had lodged in favour of the resolutions.

The Chairman having proposed the second resolution, which was seconded, an amendment—"That the shareholders here present support the petition, which has already been presented, for the compulsory winding-up of the company"—was proposed by Mr. Smith-Wright and seconded by Mr. Hatton.

The amendment was then put to the meeting, and was carried with seven dissentients. The Chairman thereupon demanded a poll.

The second resolution on being put was defeated by a unanimous show of hands. The Chairman again demanded a poll.

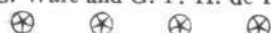
With regard to the third resolution, Mr. Casson said that the resolution was an extraordinary one, which required a three-fourths majority and due notice as an extraordinary resolution. The directors had not given such notice, and he urged shareholders not to vote, but to leave the meeting.

The meeting then broke up after about three hours.

NEW COMPANIES REGISTERED.

Air Service, Ltd., 233-235, Queen's Road, Battersea.—Capital £100, in £1 shares. Constructors and manufacturers of kite, nurse, and spherical balloons, airships, and aircraft of all kinds, &c. First directors, T. Edwards and A. Leather.

Ware and de Freville, Ltd., 6, Great Marlborough Street, W.—Capital £10,000, in £1 shares. Manufacturers of and dealers in aluminium alloy pistons for aircraft and other engines, &c. First directors, A. E. Ware and G. P. H. de Freville.



Notice to our Readers.—Owing to pressure on our space it has been necessary to hold over the second instalment of the article on the Mercedes engine, together with several other regular features.

A Real Weather Coat.

It would at first sight appear difficult to effect improvements either in the quality or the utility of flying equipment. Yet as experience is gained by pilots under Service conditions, and their views expressed to the manufacturers, ever ready to bring skill to



bear in meeting requirements, minor improvements are continually being made.

Illustrated on this page is a Service coat by Messrs. Robinson and Cleaver, of Regent Street. It is made in black leather for R.N.A.S. pilots and in tan for those in the R.F.C.

The coat in question is made specially durable to withstand hard wear, whilst remaining soft equally with the lighter ones. It may be had unlined, or lined throughout with sheepskin, in either colour at £5 5s. and £8 8s. respectively.



PUBLICATIONS RECEIVED.

Aircraft in Warfare: the Dawn of the Fourth Arm. By F. W. Lanchester, M.Inst.C.E., M.Inst.A.E. London: Constable and Co., Ltd. Price 12s. 6d. net.

Annual Report of the Smithsonian Institution, 1914. Washington, U.S.A.: The Smithsonian Institution.

Aero Engines. By G. A. Burls, M.Inst.C.E. Third Edition. London: Charles Griffin and Co., Ltd. Price 8s. 6d. net.

Simple Russian in Three Months Without a Master. Part I. London: Hugo's Language Institute. Price 1s. 6d. net.

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